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CAR ACTION

TALK WITH THE EDITORS
on Internet (see page 7)

THE WORLD'S LEADING R/C CAR MAGAZINE

July 1994

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TESTED IN THIS ISSUE

- Tamiya's new FWD Honda Civic
- Mugen's Sport Seven nitro buggy
- TR15T: Tamiya's first gas-powered truck



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R/C action! (Photo by John Huber.) This page: BMX faces off against R/C. (Photo by Tony Donaldson.)

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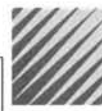
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EDITORIAL



Downplay the Dollars

It's time to change our image! We have to stop bragging about how much money we've spent on equipment to the guy who's thinking about buying an R/C car. Hey! If you can afford to spend \$600 on a motor dyno, then more power to you, but be careful not to give the wrong idea to the new guy. He might think that he'd have to spend as much to enjoy the hobby, too.

From now on, when someone asks: "How much does one of those cars cost?" be realistic in your reply. Tell him that the car is cheaper than he might think. Sure, mention how much you've spent on your car kit if you want to, but also tell him that there are many available entry-level kits that will get him started for a lot less than the cost of your all-out race ride.

I've seen quite a few changes take place during my nine years in the radio-control hobby; most of them were to car kits. Did you know that on average, car kits cost less now than they did in the late '80s? I remember paying nearly \$200 for one of the original RC10s, yet today, I can pick up a brand-new Team Car kit for about \$160. Do I need to mention that the Team Car performs substantially better than the original? Wow! A car that works better yet costs less? Spread the word.

R/C cars are very technical and can be quite intimidating to the uninitiated. Here, our job as magazine publishers—and it's your job, too, if you want your hobby to continue to flourish—is to make R/C cars both fun and easy for newcomers. Please, people, don't scare 'em away with tales of how much you spent. We'll try to do the same!

CAR ACTION GOES ONLINE!

Have a question or comment? E-mail us at our Internet addresses.

Frank Masi: frankm@airage.com; John "Doogie" Howell: johnh@airage.com; Karen Jeffcoat: karenj@airage.com; Chris Chianelli: chriscc@airage.com.

If you'd like to order a subscription, send your postal address to: rcca-subscribe@airage.com.

Frank Masi

LETTERS

WRITE TO US! We welcome your comments and suggestions. Letters should be addressed to "Letters," *Radio Control Car Action*, 251 Danbury Rd., Wilton, CT 06897. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

MOTOR MADNESS

I want to buy a modified motor, but there are so many of them that I don't know which one to choose. I have an RC10T and a Futaba Sport radio with the MC210CB ESC. I plan to spend about \$50 on the motor. Can you help me?

BRYAN P. McKERNAN
Redlands, CA

Well, Bryan, your Futaba MC210CB ESC wasn't exactly designed to handle a modified motor; it was designed to be a good ESC for a stock motor. Your best bet is to buy a fast stock motor, something like Trinity's Slot Machine 2 or Green Machine 2, Reedy's Mach I or Mach II, or Twister's Scorpion II. If you really want a modified motor, make sure that it's a very mild one (don't go below an 18-turn wind). Make sure your ESC receives plenty of cooling air over its heat sink, and don't gear too high, or you'll quickly fry your ESC.

In all honesty, though, your best bet is to stick with a stock motor. If you want to run a modified motor, consider upgrading to an ESC that was designed to handle one, such as a Novak Rooster or 610RV (both have reverse), or 410 M5. You could also check out a Tekin 411P2, 410S2, or 610-R, which has reverse. Hitec and SCI also make high-quality ESCs that can handle modified motors. Good luck! JH

TOO TIRED

I have a Kyosho Nitro Thrasher with full bearings, aluminum hubs, a mini pipe, a blue heat-sink head, a three-shoe clutch, a light flywheel and a light clutch bell. It's controlled by a Futaba Attack 3 radio. Acceleration is pretty impressive with the O.S. 12 CZ-R, and the power is incredible, but I'm thinking about mounting USA-1 tires on the truck. Would this slow

acceleration very much? Which type of servo should I use? I also have a question about its gearboxes. The manual doesn't say anything about grease or lubrication, so I don't know whether to grease them or not. Nobody around here knows anything about gas cars, so I'd appreciate your help. Keep up the good work.

TIM STEPHEY
Havertown, PA

Well, Tim, I talked to our resident truck expert—"Truck Stop" columnist Dave Sproul—and he told me that mounting USA-1 tires on your Nitro Thrasher rims won't work; they're the wrong size. As for mounting USA-1 wheels on your Nitro Thrasher, unfortunately, that won't work either, because the USA-1's wheels are deeply offset. If you tried mounting those wheels on your truck, they might not clear your truck's suspension arms.

If you somehow make an adapter that does allow you to use USA-1 wheels, then you're going to have to use a different pinion on your clutch bell. Try using a pinion with as few teeth as possible—at most an 11-tooth or less.

As for your servo situation, try using a Futaba 9301 or the 9601, which has metal gears. Both servos have plenty of torque, which should help turn those tall tires.

The next time you tear apart your gearbox, lightly lubricate all your gears, especially the spider gears, with a light grease or a silicone grease. A little will be sufficient. JH

2WD BUDGET SHOOTOUT

First of all, great magazine. All the tips really go a long way in helping out racers like me. Why doesn't *Car Action* do a budget-racer shootout? It could be on the Traxxas Rad 2, the Losi Junior 2 and the Associated Stealth tranny car. I'm sure that a lot of budget racers would appreciate this; we all can't afford Team Cars, Pro-SEs and TRX-3s. Thank you.

COREY ALLERT
Brooklyn, NY



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Well, Corey, we do have an entry-level 2WD buggy shootout planned for the August issue, so keep your eyes peeled for it. In the shootout, the cars will be equipped with entry-level ESCs, budget stock motors and inexpensive servos. Stay tuned!

JH

BODY BY...

I'm an avid (very avid) reader of the best R/C mag in the universe. I'm looking at getting the Associated RC10T Sport Truck; would the A&L Roadkill Conversion work on it? Another thing, I keep seeing names like Bich'n Bodies popping up in Track Reports; would they paint a body for any average racer? If so, do you have to supply the body? They have some pretty awesome paint schemes. Well, thanks for your time and addition to this wonderful hobby.

JUSTIN OWEN
Indianapolis, IN

Yes, Justin, the A&L Roadkill conversion kit will work on an Associated RC10T Sport Truck. Currently, there are two versions available: the beginner kit (no. 5130) comes with older-style monster-truck foam wheels that make your truck slightly wider, and the intermediate kit comes with NORRCA-legal racing foams, which are better for serious oval racers. If you have any questions, contact Daryl Lane or Chris Allec of A&L at P.O. Box 2115, Corona, CA 91718; (909) 735-5249.

Yes, luckily for the general public, our body painters will paint bodies for anyone. Most painters will supply a body for you but, obviously, it will cost you more. Some top body painters are Scot Bich of Bich'n Bodies, 4903 Cloverfield Dr., Pearland, TX 77584; (713) 485-0413; Richard Muise of Motion Graphics, 2645 Robert Arthur Rd., Westminster, MD 21157; (410) 848-0008; and Mort Flint Jr. of Outrageous Paints, 115 Fourth St. Ext., West Glens Falls, NY 12804; (518) 423-5486.

JH

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EV10SS SETUP FOR FLAT OVALS

In the last six months, the R&D staff at Trinity has found a way to go faster on flat ovals. It doesn't matter if they're carpet, asphalt or concrete, just as long as the track is flat. The way to do it is to widen up your narrow superspeedway cars. This doesn't mean that "wide" is better everywhere—just on flat oval tracks. Your EV10ss will still be the best way to go in narrow form for banked ovals of any type. Here are a couple of ways to widen your EV10ss car quickly and easily.

First, we'll start by replacing the front plate. Swap the stock plate from the EV10ss with the wider front plate from the on-road EV10 (EV0046, \$17.99). This part is an easy bolt-on part and will widen the front end by about .900 inch. Try this with a 10L! If you would like to go even wider, in case the track is slick, try our wider front axle (EV0135, \$20). When you do widen the front end, you'll probably want to get the proper-length turnbuckles as well (EV0027, \$10.99). The reason for widening the front end is to provide a wider base for the car to sit on. This increases the corner speed and makes the car more stable, since there's no banking to assist with this.

Now that we have the front end widened, we need to widen the rear end. Since all the EV10 series of cars have the same rear centerline and the same axle spacing on the differential side of the axle, we simply need to install our on-road hub set on the car (EV0120—purple left-side clamp hub, \$29.99; EV0122—purple right-side diff hub, \$25.99). Once these hubs are in place, the left-side hub will need to be spaced out about 3/8-inch to center the axle. If you need spacers to do this, try our nylon spacers (EV0082, \$1.99).

One thing to remember: now that the car is wider, you'll need to use one of the wide bodies offered by all the body manufacturers in the industry.

Now that the assembly is complete, you're in possession of the most lethal car for any flat oval!

Good luck and good racing!

Joel "Magic" Johnson,
Trinity R&D

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Part nos.—3807 (RC10), 3808 (RC10T), 3809 (RC12L), 3810 (RC10L), 3811 (RC10GT); **price**—\$2/sheet.

Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342; fax (714) 850-1744.



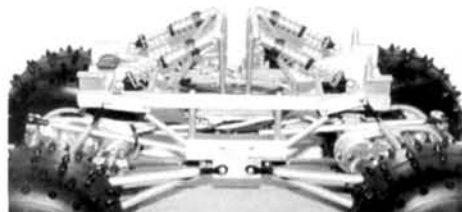
ESP HOBBY MFG.

Clodzilla III Suspension

With this unique cantilever kit (released just in time for use with the new Clodzilla III full-race chassis), you mount the shocks inboard above the chassis, and that greatly increases suspension travel. The kit includes all the hardware needed for installation. You'll need the Clodzilla III chassis (no. ESP036), a multi-link suspension (no. ESP032) and four 4-inch oil shocks.

Part no.—ESP039.

ESP Hobby Mfg., 6215 Lou Ave., Unit C, Crystal Lake, IL 60014; (815) 455-5440.



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Prices—\$3.99 each. (Losi and Associated); \$4.99 each (Traxxas).

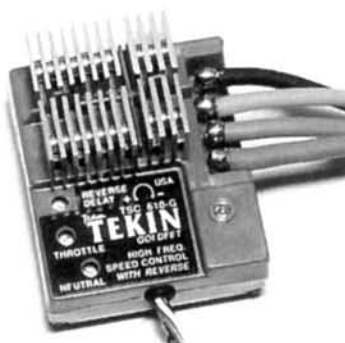
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Part no.—RX104.

Model Rectifier Corp., 200 Carter Dr., Edison, NJ 08817; (908) 248-0730.

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This new version of the most popular NORRCA-legal Monster Stock Jr. motor uses the all-new Epic EX-Tech EZ Flow™ endbell-and-can technology, which allows your motor to run much more coolly. The magnets are the latest 5.0 wet type, and the motor can has a three-hole pattern that tailors the magnetic field to the new, short-stack, slotted armature blank. Trinity's laydown brushes allow more commutator wrap and more horsepower. This new motor is faster, cooler-running and more efficient than the original.

Part no.—RC1001; **price**—\$32.

Trinity Products, Inc., 1901 E. Linden Ave., #8, Linden, NJ 07036; (908) 862-1705.



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Part no.—PSRG2006; **price**—\$22.

Paris Racing; distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826; (217) 398-6300.



DYNAMITE Pro-Start

This starter box easily, quickly and reliably starts engines in 1/10-scale on- or off-road cars or trucks, and in 1/8-scale off-road cars. Just set and align your vehicle to three mounting posts on the box, and push the vehicle down. The chassis hits a heavy-duty spring-activated switch and automatically turns on the starter. Push a little further, and the engine's flywheel comes into contact with the spinning starter wheel, and presto!—ignition! Get started right with the Dynamite Pro-Start!

Part no.—DYN5600; **price**—\$109.95.

Dynamite; distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-9511.



TRINITY®

FULL POWER...

The Trinity Motor Sleeve

The desire for more performance is putting demands on motors that were never considered when the ROAR motor rules were originally drafted. Because of this, we are burdened with rules that make it difficult to produce equipment that will withstand the power available from present-day batteries—the Sanyo SCRC in particular. This is an ongoing battle, and right now, cells are getting better. It looks like the batteries are winning.

One of the most important parameters in motor design is the structure of the magnetic field assembly, the can and the magnets. The strength of this field is one of the primary factors that will determine the ultimate maximum power the motor will produce. What happens when a motor is used is that the field from each pole of the armature tries to demagnetize the tips of the magnets. When this happens, the motor will never run as well as it once did, unless it is re-magnetized. This problem is not caused by heat, as many people think, but by excessive current passing through the motor. This can be lowered by: 1) using lower capacity cells; 2) running longer heats; 3) the proper use of a current-limiter speed controller. Some of these ideas are practiced in Europe and Japan, and some are used here on a small scale.

The other avenue of attack is to make the motor more resistant to this effect. This is where the Trinity Motor Sleeve comes into play. The problem with present rules is the maximum diameter of the can. We are at the maximum limit at the present time. The only way to increase the effective can thickness, and thus improve the magnetic field, is to put on an outboard metallic addition to the can. This is what the Sleeve does.

The use of the Sleeve can be dramatic in some cases and, in others, very slight. In 1/2-scale, its advantage would be minimal. In applications where every ounce of energy is consumed from SCRC cells, such as 1/10 on-road, 1/8 oval and dirt oval, it could be a big advantage.

Hints: when you use it, remove the sticker from the can and gear up one tooth. Have fun!!!

Trinity Motor Sleeve—#RC-4102

*Until next month,
Neal McCurdy
Trinity Team Manager*

ADVERTISEMENT



INSIDE SCOOP

by CHRIS CHIANELLI

IN SEARCH OF FUN AND GLORY, 'CAUSE LIFE'S TOO SHORT TO BE A SHEEP!



Italian Powered Tamiya

Italian glow-engine manufacturer OPS has designed a .15-size pull-start engine exclusively for use in Tamiya 1/10-scale vehicles. Moreover, Tamiya will be the exclusive Japan-



Tamiya Inc. president Mr. S. Tamiya (left) and president of Mondialmotor Group/OPS, Piero Muzio.

ese distributor of OPS products and the products of OPS's Bologna-based sister company, BMT, makers of world-class 1/8-scale and 1/10-scale on-road race cars. Tamiya needs no introduction as the leader in model car trends, nor does OPS as the maker of finely crafted, high-performance racing engines. The agreement should serve all parties, including us modelers, well. Good luck in the partnership.



Southern Rock by Team Associated

Tampa, FL: It was the Car Action/Team Losi-sponsored 1994 Off-Road Winter Champs, and 430 entrants from the United States, Japan, Germany, Sweden and South America came to seek victory at the coveted event. When the smoke cleared, however, it was Team Associated who had all but shut out other hopefuls. The results speak for themselves. Team Losi and Peak Performance were the only other names making a showing in the top 10. All Associated RC10T trucks and RC10 buggies were powered by Reedy Sonic motors. Top qualifiers were Masami Hirosaka and Mark Pavidis. Congratulations, Team Associated!

Off-Road Winter Champs Results

Modified Truck

Place	Driver	Truck
1	Mark Pavidis	RC10T
2	Jason Ruona	RC10T
3	Carlos Gonzales	RC10T
4	Derek Furutani	RC10T
5	Paul Wynn	RC10T
6	Bret Reelfs	RC10T
7	Scott Hughes	RC10T
8	Greg Hodapp	RC10T
9	Ruffy Rios	RC10T
10	Mike Weed	Losi

2WD Modified

Place	Driver	Car
1	Masami Hirosaka	RC10
2	Mark Pavidis	RC10
3	Matt Ledger	RC10
4	Carlos Gonzales	RC10
5	Scott Hughes	RC10
6	Cliff Lett	RC10
7	Greg Hodapp	RC10
8	Jason Ruona	RC10
9	Scott Roberts	Losi
10	Rick Hohwart	Losi



From left: Associated president Gene Hustung, trophy girl Melissa Faland and Team Losi president Gil "Pops" Losi.

MEANER & GREENER



Well, the Green Machine 2 really isn't any greener than the original Green Machine, but in terms of meanness, Trinity's master motor-maker Neal McCurdy has done it again. In the new stock-class, ROAR-legal 24-degree Green Machine 2, Neal opted for a tri-rotor armature design; Type 1 magnets; silver lay-down brushes; shunt braid that's soldered (not screwed) to the brush-hood heat sinks; and brush springs made of heat-treated piano wire with a 5½-turn coil. Trinity has also developed a new end-bell with improved venting for cooler running. It's a mean, green, street-fighting machine, right out of the package.

TAMIYA

Sauber C12

The latest version of the Tamiya F1 chassis is the F103 model, which is shared by the Lotus 107B and the newly introduced Sauber C12 pictured here. Improvements on the older F102 chassis are a center-mounted, upright steering servo; steering rods of equal length for improved geometry; quick-release battery holder; quick-change front coil-springs; and an inclined rear spring unit with a triple-disk friction damper. Even with all the updates, the new chassis is compatible with most other Tamiya bodies and wing and race accessories. Watch for our review.



Winning is What Separates Champions From Everyone Else. And We've Won It All!



- ☐ IFMAR 1/10th, On-Road Modified World Championship - Joel Johnson
- ☐ ROAR 1/10th, On-Road, Modified National Championship - Joel Johnson
- ☐ ROAR 1/12th, On-Road, Modified National Championship - Joel Johnson
- ☐ 4-Cell Modified Winter Nationals Modified Championship - Mike Blackstock
- ☐ U.S. Oval Masters Modified Championship - Mike Blackstock
- ☐ ROAR 1/10th Speedway Modified National Champion - Ernie Bucci

Trinity Team Pushed battery championships are all in super-competitive national and international modified pro-class racing, not in stock or regional events.

Trinity Products Inc, 1901 E. Linden Ave #8, Linden, NJ 07036 • (908) 862-1705 • Fax (908) 862-6875

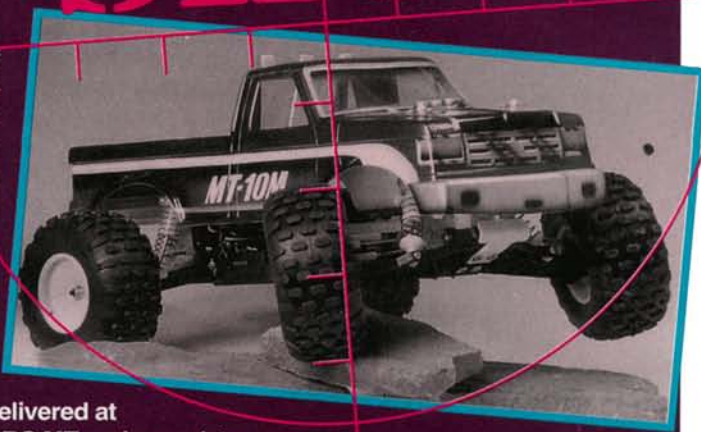
©Trinity Products, Inc. 1993



MT-SERIES

SPY SHOTS

Here are some infrared spy shots of MRC's new MT 1/10-scale trucks—the MT10S Stadium Truck (above) and the MT10M Monster Truck. These trucks, reported to be very fast, have competitive features such as lightweight, non-flex, fiber-reinforced, resin chassis; adjustable toe-in and camber; adjustable slipper clutch and ball diff; oil-filled, coil-over shocks; and resin-compound front and rear wide-suspension arms. Information reconstructed from shredded documents indicates that these features, and much more, will be delivered at breakthrough prices. Stay tuned for further MRC MT-series updates.



GET A GRIP.

Gettin' sideways is cool if you're running dirt oval, but if you're racing on carpet or asphalt, it doesn't cut it!

To improve foam tire performance on hard surface tracks, the race team worked with the chemical engineers at Trinity to develop Zip Grip™, a custom, hand blended R/C foam tire traction compound.

Using Zip Grip provides the most precise and repeatable tire performance on carpet or asphalt R/C racing tracks, of any formula available today. And, the new style applicator keeps the Zip Grip on your tires and off your hands.

So if you've been getting entirely too familiar with the turn marshals, it's time to "get a grip" with Zip Grip!

TRINITY®

1901 E. Linden Avenue, #8, Linden, NJ 07036 ■ 908.862.1705 ■ Fax 908.862.6875





Dahm's Formula

These new F1 bodies, Type-F (above) and Type-J, from Dahm's Racing Bodies are perfect replacements for Tamiya and Kyosho F1 chassis. Each features Ferrari styling, aerodynamic design, a driver and Dahm's decals



at a list price of \$16.98. The Type-F body is shown on Tamiya's Lotus 107B Ford with Tamiya Ferrari decals, and the Type-J is shown on Kyosho's Jordan Yamaha chassis with Jordan decals. Dahm's new Thunderbody (Lexan underbody), which fits both, improves handling, keeps out dirt and looks more realistic. Retail is \$7.98. For more information, call Dahm's Racing Bodies at (707) 792-1316.



Novak has taken their One-Touch Set-Up™ that proved to be so successful on the Rooster reversing controller and incorporated it in the Duster, an affordable sport/performance, forward-only controller. One touch is all it takes for easy setup and adjustment, and new circuitry maintains control of the vehicle even after the batteries have dumped. Other features include dual-level thermal-overload protection; digital anti-glitch circuitry; and factory-installed bullet and Tamiya-style connectors. It's recommended for use with 4- to 10-cell battery packs and either stock or modified motors. For more information, contact Novak Electronics Inc., 18910 Teller Ave., Irvine, CA 92715; (714) 833-8873.



Novak's Got The Touch



TAMIYA R&D Facility NEARS COMPLETION

Adjacent to Tamiya America's headquarters in Aliso Viejo, CA, the Tamiya test track, also to be used for planned competitions, is in the final stages of construction. In typical Tamiya fashion, this track is certain to be a world-class facility featuring the AMB/Autoscore automated lap-counting system; a pit area with ample AC power access (see photo below); and a mirror-smooth, high-traction, asphalt surface. The track measures 154 by 46 feet and is designed for many configurations, including a high-speed oval, or one of many road-course layouts and even small Tamtech circuits. All this in the sunny hills of Southern California. Actually, by the time you read this, the track will have been completed, and Tamiya will have already held their first event—the inaugural Tamiya Championship R/C Series race.



DAHM'S RACING BODIES



NEW! D042 SPICE Long Tail IFMAR World Champion - Art Carbonell takes 1st Place "A" Main 10th Scale Gas at the Florida Winter Nationals with Dahm's New D042 Spice! This Super Aerodynamic, Well Balanced, Low Profile Racing Body fits Serpent Impact, Delta, BMT 931, & Others!
NEWS FLASH!! Art Carbonell TQ'ed & Won the 10th Scale Gas On-Road U.S. Challenge in Dallas, TX with His Spice/Serpent! A Spice/Serpent also Won Concourse!



NEW! D031 TYPE C Racing Body Fits Tamiya & Kyosho Indy & Formula One Cars. Super Low Aerodynamic 1994 Penske Indy Styling. Includes Rear Wing!



D034 TYPE F and D036 TYPE J
NEW! Racing Bodies for Tamiya & Kyosho Formula One Cars. Super Realistic, Aerodynamic Replacement Bodies! Lexan **THUNDERBODIES** Available for Each Style!



NEW! D038 SLAMMER GT™
Hot New Stadium Race Body for the RC10GT. '94 Chevy S10 Styling. Superior Handling, Fine Detail, & Excellent Cooling.



NEW! D033 COYOTE™ Realistic, Aerodynamic, Pro-Racing™ Body for the Mugen Athlete. Includes Racing Wing! Low, Light, Tight, & Narrow!!

CALL US AT: 707-792-1316 TO FIND OUT WHICH BODIES FIT YOUR CARS! SEND \$2.00 FOR CATALOG OR \$4.00 FOR CATALOG & DECALS TO: **DAHM'S, DEPT A, P.O. BOX 360, COTATI, CA 94031 USA**

PUBLISHER'S PAGE

Tom Atwood named Group Editor-in-Chief



As a reader of *Radio Control Car Action*, you might not be familiar with the name of Tom Atwood. Since 1990, he has been editor-in-chief of our sister publication *Model Airplane News*. Tom is the man who has so carefully molded that magazine into a publication that fulfills many roles: at once serving as an information source—a helpful hand to aeromodelers—and an enthusiastic, supportive voice in the hobby.

Tom's tenure with *Model Airplane News* has been marked by success: in attracting high-caliber contributors and carefully fashioning the magazine to meet the needs of readers. Tom has helped it become the most widely read and respected R/C aeromodeling publication, with a paid readership of 90,842 (six months ended December 31, 1993, as filed with the Audit Bureau of Circulations, subject to audit).

I'm pleased to announce Tom's promotion to Group Editor-in-Chief for all Air Age publications. For readers, advertisers and friends of all our magazines—*Radio Control Car Action*, *Model Airplane News* and *Radio Control Boat Modeler*—that's good news. Why? Because it means that Tom's editorial expertise, his boundless enthusiasm for all things R/C and his unique ability to communicate effectively with hobbyists will touch not only the readers of *Model Airplane News*, but also tens of thousands of other R/C enthusiasts, too.

At Air Age, we pride ourselves on our efforts to serve our audience and to help the radio-control hobby grow and flourish. And that's why we take so much pride in all our employees—men and women who, like Tom, are dedicated to producing the very finest, most useful R/C magazines available. In short, we're all here to help you enjoy your hobby.

Louis DeFrancesco Jr.
Group Publisher

READERS' RIDES

"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 251 Danbury Rd., Wilton, CT 06897. If the Ayatollah of Radio Controlla chooses your photo, you'll receive a 6-month subscription to Car Action, or an extension of your existing subscription. You'll also be eligible for the fourth annual "Reader's Ride of the Year Contest" in the fall of 1994. Write your address and phone number on your letter and on the back of each photo you send, in case we need to contact you.



HAWAIIAN CRUSHER

Roaming the sandy shores near Kahului, HI, Kyle Takushi's tricked-out Clod Buster is equipped with an aluminum chassis, a cantilever multi-link suspension kit, aluminum skidplates and ESP aluminum lower bumpers. The tires are Kyosho USA-1 treads, and the motors and ESC are stock. Kyle's friend Kyle paints full-size autos, and he helped to paint the truck a sharp-looking pearlescent magenta color. Kyle plans to upgrade his truck soon with new motors and an ESC.

ONE BAD NOMAD

Doug Peterson of Menlo Park, CA, built this Tamiya Clod Buster for pulling events. The truck is equipped with two Kyosho 360 motors, a Novak ESC, eight oil-filled Gold shocks and an ESP lift kit, chassis brace and suspension stabilizers. Other mods include Pro-Line tires, a Maxtrax pulling hitch, a Parma Nomad body, two Parma Hemi engines and a scratch-built interior. Doug says that the truck took first place in concours events five times in 1993.

HUH, HUH...COOL!

"Heh, heh. Hey Butt-head; lemme drive the truck, wus-brain!" "Shut up, Beavis, or I'll run this truck over your head!" Whoa, fellas; calm down! Will Smith of Ventura, CA, sent us this photo of Butt-head's new ride, which happens to be a totally altered Outlaw Ultima. The



truck is equipped with HPI wheels, Traxxas Sledgehammer tires, a graphite chassis, a fiberglass radio plate, an A&L Lethal Weapon tranny, a Novak Rooster ESC, a 16 triple modified motor and eight oil-filled shocks. A Dahm's Commando Explorer body tops it off. According to Will, the truck has 3 inches of ground clearance and can run over anything—including Beavis's head!

THE GAMBLER

Kenneth J. Rogers of Tunnel Hill, GA, sent us this photo of his Traxxas LS-II. Kenneth's truck has been modified with a Tekin 410K ESC, a JR 4735 steering servo and an East Coast 12-turn double modified motor. The spur gear and the center gear in the tranny have been modified to ride on ball bearings. Other mods include Team Losi shock springs and a New Wave 1700 SCRC 6-cell pack. And by the way, Kenneth, don't worry; we're going to spare you all the Kenny Rogers country-western jokes we were thinking of.



TROUBLESHOOTING

by JOHN HUBER

Illustrations by Steve Collins

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, Radio Control Car Action, 251 Danbury Road, Wilton, CT 06897. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.

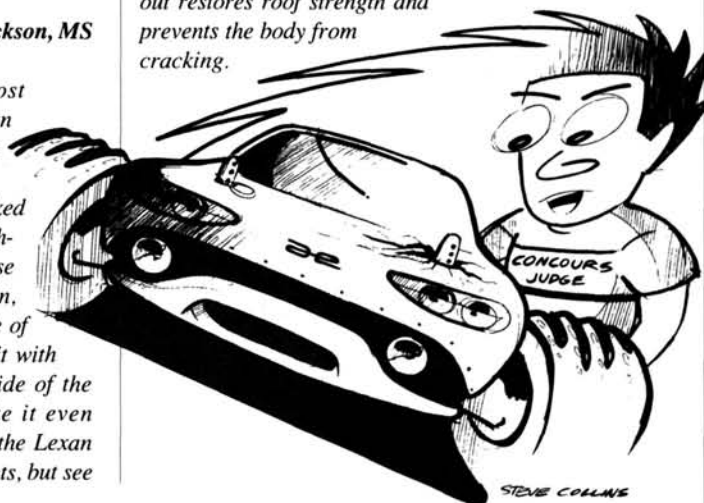
Body Bashing

A few days ago, I drove my RC10T into the curb. When I was taking the body off, I noticed that it had broken in front of one of the rear body-mounting posts. A couple of days later, I noticed that the paint was starting to chip off around the crack. Is there any way to fix the body and the paint job?

CHARLES HAMMOND, Jackson, MS

I've bashed so many bodies that I've lost count. No body will last forever, but you can prolong its life. You can fix the crack with Shoe Goo, some scrap Lexan and some double-sided foam tape. If the paint has flaked off, simply repaint the bare spots after roughening the area and removing any other loose paint with sandpaper. If the body has torn, fold the pieces back into shape. Cut a piece of Lexan to the right size, cover one side of it with foam tape, and stick the piece on the inside of the body over the tear. If you want to make it even stronger, apply Shoe Goo to the edges of the Lexan patch. It might be tricky near the body mounts, but see

what you can do. You can also use this method to strengthen a body that has obvious weak spots. I often add a strip under the tail of a truck body to make a sturdier mount for the rear spoiler. Thin strips applied to the roof posts of a truck that has the windows cut out restores roof strength and prevents the body from cracking.

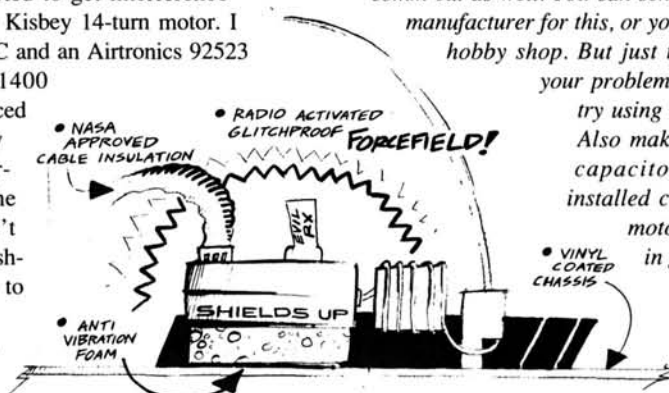


Maniac Motor

I've been R/C racing for about two years. Recently, I noticed that after running a certain distance, my car takes off without control. I have no idea what's causing this. I started to get interference when I installed my UNO Kisbey 14-turn motor. I have a Novak 410-M5 ESC and an Airtronics 92523 AM receiver, and I use 1400 SCR batteries. I just replaced my brushes because they arced a lot! I thought perhaps the arcing caused the interference. I still don't know because the new brushes arc also. What can I do to solve this problem?

BILLY EVERTON,
Ontario, CA

I think your motor is the problem, and replacing the brushes is only part of the solution. If your motor has been used a lot, you'll probably have to have the comm cut as well. You can send it back to the manufacturer for this, or you can visit your hobby shop. But just to be sure that your problem is your motor, try using a different one. Also make sure that the capacitors have been installed correctly on the motor and are still in good shape.



Too Cool, Man!

I have a major problem. I recently bought a 6-cell Team Smooth battery. I soldered the cells together using the supplied braid and then charged the pack. The joints were covered with a lot of solder, because it was the only way to get them to stay together.

light-duty solder and electrical flux with a now-broken 30W soldering iron. Please help me!

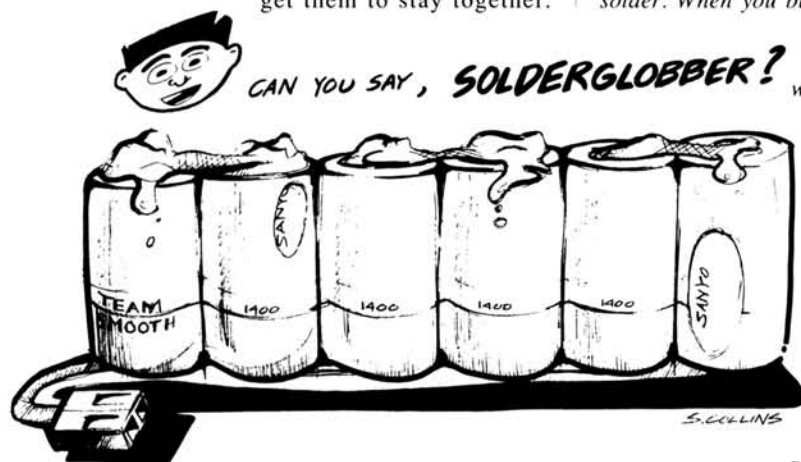
MARK KRUSE, Davenport, IA

Mark, your problem stems from your iron and your solder. When you buy a new iron, buy one with a

high wattage rating. The higher the rating, the faster it will melt the solder and the easier it will be to make a battery pack. If your iron isn't hot enough, you'll damage the cells by heating them too long. Check out the Ungar Race Station; it's awesome!

Also make sure that you use only rosin-core solder! It's designed specifically for electronics and contains the flux right in the core. You can find it at your local Radio Shack store. You'll know

you've got it right when the solder flows smoothly onto the cell and the braid and then hardens with a bright shiny finish.



Later, when I was just looking at it, one of the solder joints broke. My friend and I have had this problem with all our batteries. We're using

In a Bind? Blown a Wind?

Help! Help! Help! I own a Team Losi LX-T, an Airtronics XL2P controller, a Novak 410-M5 ESC and a Peak Performance stock motor. I'm not a really good driver, and I crash into a lot of things. Two days ago, I crashed the truck into a tree, and when I went to pick it up to turn it around, it didn't work. The steering still worked, but the truck didn't move. The ESC's green light went on when I pushed it to full throttle. What's the problem—the motor or the ESC? Please help!

**SHAWN UYEHARA,
La Palma, CA**

Shawn, you're lucky. If all your radio gear still functions and the light on the ESC still operates, your motor is probably what's giving you the trouble. First check to see that the wires are still connected. If they are, remove the brush springs. Gently pull the brushes out; one might have jammed. Then slip

them back in, making sure that they go in smoothly, and reattach the springs. If that doesn't do it, try another motor. If the second motor works, the first motor might have a blown wind, in which case, you should replace the armature.



Geared to Go!

I am writing about installing a new Paris Picco P5 stock .21 engine in my Inferno. Obviously, this installation didn't seem to be much of an undertaking, but I seem to have run into a snag. I bought the Picco engine, adjustable engine mounts, four-shoe clutch/flywheel combo and an 18-tooth ball-bearing clutch bell from JR/Ace Hardware. All the equipment arrived as expected, and JR's service was excellent. Here's my problem: the engine mounts are attached to the engine and to the chassis (the countersunk anodized blue one), and the clutch bell/flywheel is attached to the Picco, as suggested. The clutch-bell teeth are still more than $\frac{3}{8}$ inch ahead of the center differential gear. The spacer that's provided with the flywheel is sufficient and appears to be the correct size, as are the clutch nut and the clutch bell. Any suggestions?

RAY E. ANGLE, Willimantic, CT

Ray, there are several ways to align the gear properly. First, check to see that the gear has been bolted onto the

diff exactly as shown in the instructions. Sometimes, a

gear is offset slightly, and reversing it might do

the trick. You can also adjust the

alignment with a flywheel spacer. If

you need to move the clutch bell rearward,

see if you can remove a spacer. Finally, check

the engine mount. If it's tapped for a fixed

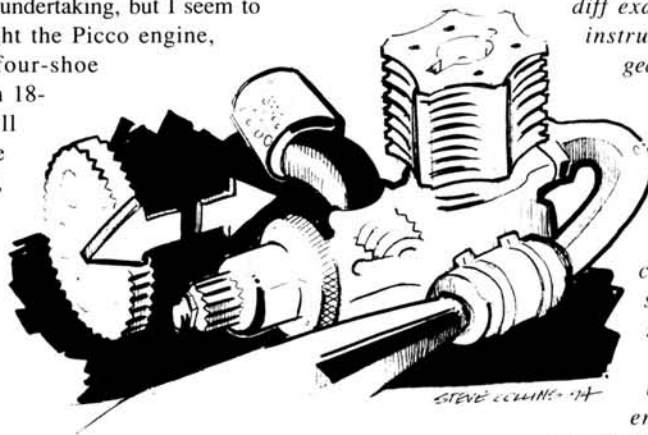
engine location, make sure it isn't in backward. This

will affect how far forward or rearward the engine sits. Some engine mounts have slots for the engine bolts. This

not only makes the mount adaptable to almost any engine, but it also allows you to adjust the engine's position on

the mount. Check your car again; I think that you'll find a solution. You might have to use a combination of things to

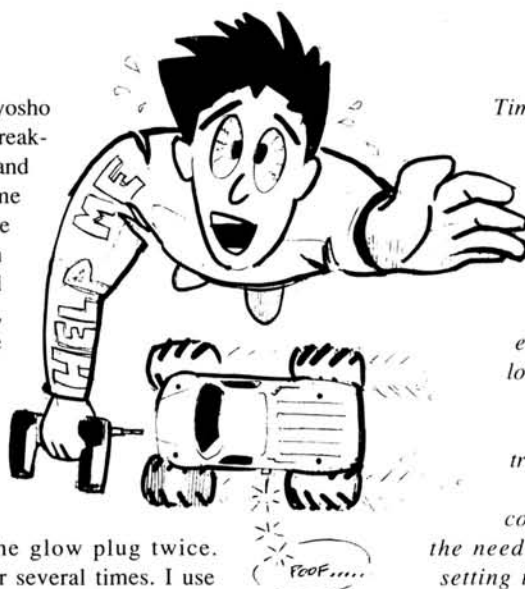
get it right.



Too-Lean Machine?

Two months ago, I bought a Kyosho Nitro Thrasher. During the break-in period, I had no trouble starting and running it. Recently, it has become harder to start, and it stalls while idling if it sits too long. When starting, it runs for a second and then dies. The fuel line is clean, and plenty of gas is getting to the carburetor, but the engine doesn't run consistently until it has gone through a cycle of starting and sputtering at least two or three times. The needle valve is set to two-and-a-quarter turns, so it isn't lean, and I've replaced the glow plug twice. I've checked the glow-plug driver several times. I use 15-percent-nitro fuel and a Tower Power starter. The hobby shops around me don't really know much about gas cars and trucks.

TIM STEPHEY, Havertown, PA



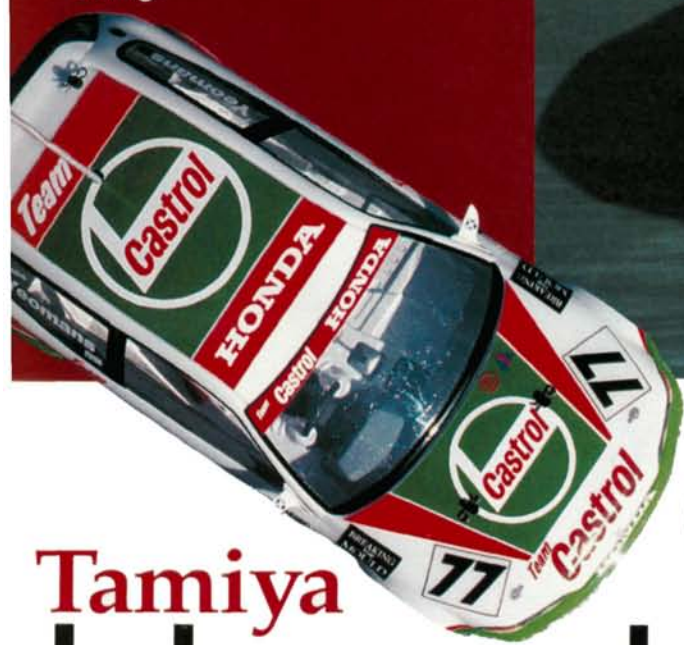
Tim, as your engine is broken in, you'll have to adjust the needle settings—including the low-end needle—to maximize performance. Get the engine up and running and cleared out, then pinch the fuel line near the carb. If the engine dies immediately, your low-end setting is too lean. Turn the screw counterclockwise a couple of clicks and try again. The engine should rev for about 5 seconds and then conk out. After you've adjusted the needles, make sure that the idle setting is enough to keep the engine running. ■

by John Huber

WHEN TAMIYA* MAKES a model of a full-size car, they go all out.

Not only do they reproduce the body with stunning detail, but they also add side mirrors, a detailed interior and realistic wheels and tires. In the case of the Honda Civic, they also made it front-wheel drive—something I've never tried before in radio control.

The car comes with some very nice features that will make a difference on the track. The ball diff is very nicely designed and much smoother than a bevel-gear-type diff. The shocks are also a nice touch. They're plastic, but they're oil-filled and smooth. Tamiya also includes a variety of pistons for tuning.



Tamiya Honda Civic

“The bottom line is that the Civic doesn’t handle like any other car”



Photos by John Huber

BUILDING AND DETAILING

Building the Civic is quite easy. The instructions are great, and all the parts come neatly packed so you can easily find what you need. Pay attention to little details

Civic Duties

in the instructions. I noticed that the shocks used are the same ones used on Tamiya's Alfa Romeo and Ford Escort, but they're assembled differently on each vehicle. Tamiya has obviously tested each car and

found the best settings, so start with their instructions.

Painting the Civic was fairly easy, but it's time-consuming. You only have to paint the body green and white, but careful masking is needed for the best

results. I used Pactra white paint, and I wanted to get Tamiya's green paint to

match the decals. I was disappointed, however, to find that the Tamiya sprays aren't sold in the U.S., and there wasn't a match in a bottle. I settled for Pactra's bright green, which was pretty close.

After the paint had dried, I started on the decals. This part took much longer than the actual painting. I always start with the biggest decals and finish with all the little details. To get the decals on with no little bubbles, don't remove all the backing at once. Peel back a corner of the backing and snip it off. Now you can position the decal easily. When you find the right spot, just press the corner down. Then, just flip the decal up and start to remove the backing, starting from where the corner is stuck down. Smooth the decal down with a credit card until all the backing has been removed, and rub the



The rear end of the chassis is very bare. There aren't any dogbones, gearboxes, or other components that are commonly found in RWD cars.

decal to make sure it's firmly applied. In some locations, it might be necessary to slit a decal with a knife to allow it to sit flat on the body. Then, you just paint the driver and the interior, and it's showtime!

TESTING

The first thing I noticed about driving the Civic was the way that it responded to throttle. With most rear-wheel-drive cars, punching the throttle with the wheels turned makes the car spin in circles. With the Civic, the wheels light up, but the car takes off in a slight turn. Hitting the brakes and turning will make the car spin, but a quick shot of the throttle straightens it right out again. At full speed, the steering is very responsive, and I found it difficult to drive a fine line. After I had added a little exponential control to my Futaba PCM, the car was much easier to drive.

I was impressed by the speed of the car with the stock motor. The kit comes with two gearing options; I opted for the speedier setup.

With most of the car's weight toward the front of the car, braking is also quite different. First of all, the brakes are applied to the front wheels. As with all cars, weight is transferred to the front during braking, so the Civic stops very



Scale 1/10
Price \$260

DIMENSIONS

Overall length 16 in.
Wheelbase 10.20 in.
Front width 7.25 in.
Rear width 7 in.

WEIGHT

Gross (ready to run) 3 lb., 3.3 oz.

CHASSIS

Type Tub
Material Plastic

DRIVE TRAIN

Type Gear
Primary Pinion/spur
Transmission Gear
Differential(s) Ball
Slipper Clutch None

Bearings/bushings Plastic and metal bushings

SUSPENSION

F/R: Type 4-wheel independent w/non-adjustable camber links
Damping Plastic oil-filled coil-overs

WHEELS

F/R: Type One-piece plastic
Dimensions F/R (DxW) 2.0x1.0

TIRES

F/R Semi-pneumatic street tread

ELECTRICS

Stock Mabuchi 540, 7.2V 1400mAh, ESC

OPTIONS TESTED

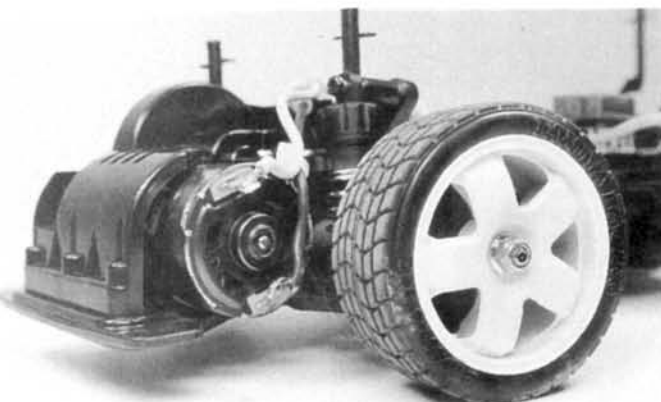
I used a Tekin* 411G for maximum performance

HITS

• Unique driving experience • Fast and fun with stock motor • Looks superb

MISSES

• Not much of a bumper to protect motor • Tamiya green spray paint isn't available in the U.S.



The motor on the Tamiya Castrol Civic is mounted ahead of the front wheels. This design helps with traction, but the motor could be damaged in a collision.

TEAM LOSI TIRES:

THEY BITE!



#A-7367(G) "IFMAR STUD"

Buggy rear tire- The Fastest 2WD Tire at the World's, Available in "HT" and "G" Compound

TEAM LOSI

13848 Magnolia Ave.
Chino, CA 91710
(909) 465-9400

HONDA

FRONT-WHEEL JIVE



The Civic's chassis layout is different from that used in most cars. Most of the weight is biased toward the front drive wheels.

In a front-wheel-drive (FWD) car, many of the components are arranged differently from those in your basic 2WD car. In a rear-wheel-drive (RWD) car, there's more weight on the rear wheels. Although it may be only a slight difference, it's designed to help with traction. As a car accelerates, more weight is shifted rearward, and traction increases even more. Rear-wheel drive is more common in the R/C world.

In a FWD car, it would only make sense that the weight would be balanced near the front, but weight also shifts rearward under acceleration. Although this helps a RWD car, it hurts a FWD car. It

takes a careful balance of weight and suspension tuning to make it work properly.

To keep the traction on the front wheels, the Civic's motor and gearbox are installed in front of the front axles. The steering servo is mounted right behind the front gearbox, and the receiver is just behind it. Located slightly back from the center of the car is the battery pack, and that's about it. The only other electronic thing behind this point is the antenna; the rest is just a hollow shell with axles and the rear suspension. The balance point of the car is just between the servo and receiver; 30 percent of the weight is on the rear wheels and 70 percent

of the weight is on the front wheels. I also noticed a bit of *toe-out* on the rear wheels (RWD cars usually have *toe-in*).

Although the rearward weight shift hurts a little in acceleration, FWD does have its benefits. As the car brakes (only on the front wheels), weight shifts forward and increases braking traction. The opposite is true in a RWD car.

So, as you can see, there's a good side and a bad side to both. To each his own!



The Civic's tires are sweet. The tread pattern really grips the pavement, and they look great with the white rims.

quite easy to spin the car around. This is also true if you turn at full speed after letting off the throttle.

The bottom line is that the Civic doesn't handle like any other car I've driven, and you must adopt a different driving style to pilot it successfully. But after you've mastered it, it's a lot of fun to drive! If you're looking for an R/C vehicle that's a combination of excellent scale detail and loads of driving fun, check out Tamiya's Castrol Honda Civic. It will be the hit of the parking lot!

**Here are the addresses of the manufacturers that are mentioned in this article:*
Tamiya America Inc., 2 Orion, Aliso Viejo, CA 92656; (714) 362-2240.
Tekin Electronics, 940 Calle Negocio, #140, San Clemente, CA 92673; (714) 366-901.

Petrol pave
mento
pounder!



TAMIYA

Tr15t

by John Howell

SINCE ITS grand opening in Aliso Viejo, CA, in early '92, Tamiya America* has continued to expand into new segments of the R/C market. In late '92, the company broke away from conventional R/C designs and introduced a unique, solar-powered R/C car—the Solar Eagle. The next big launch came in early '93, in the form of a stunning replica of an R/C Yamaha sailboat. Next was the King Hauler, a totally realistic-looking 1/14-scale tractor-trailer. Shortly after that, Tamiya pulled another rabbit out of its hat by entering the 1/10-scale gas category with the TR15T—its first-ever gas-powered R/C vehicle.

EASY-GOING ENGINE

The TR15T's key feature is its powerplant: Tamiya's own FS-15 .15 engine. Developed in Japan by Tamiya engineers, this engine has a rugged pull-starter; a dual ball-bearing-supported crankshaft; a twin-needle, helical-barrel-type car-

buretor; a dual-chamber pipe for quiet running; a connecting rod with a bronze-bushed lower end; three-window Schnuerle intake porting; and ABC (aluminum/brass/chrome) piston/sleeve technology. (The piston is aluminum, and the cylinder sleeve is brass with chrome plating.) Even though the FS-15 is a mild, all-purpose engine, it still has plenty of power—roughly the same power as a good .12 engine—but .15 engines are more reliable, generally easier to fine-tune and easier on pistons and sleeves.

A key requirement of the Japanese engineers who developed the FS-15 was that the engine would have to be user-friendly before it would ever bear the Tamiya name. And user-friendly it is; I found it extremely easy to tune and break in.

Now let's take a look at the rest of the truck.



PHOTOS BY JOHN HOWELL

RACING ROOTS

The TR15T's chassis and suspension geometry are based on its electric stadium race truck counterpart, the Dyna Blaster. For those who aren't familiar with the Dyna Blaster (see '94 *R/C Monster & Racing Trucks* for the Track Report), it's Tamiya's most serious race-oriented truck to date. Although the TR15T and the Dyna Blaster have a similar geometry, they have only a few parts in common: the suspension arms; the three-gear, ball-diff-equipped transmission; the Multi-Disk Clutch; the shocks; and the wheels. The TR15T's suspension arms and transmission cases are made of a different nylon-type, fiber-filled, fuelproof plastic. The plastic pieces on the truck are made of a durable nylon derivative.

The 2.5mm-thick Duralumin chassis seems to be rugged enough to withstand most obstacles. All the screw holes on the bottom are countersunk to prevent the screw heads from snagging on the ground when the suspension bottoms out. The chassis' cut and finish are very nice; there are no rough edges or snags. This is typical of Tamiya's high standards.

A fuelproof, 1.5mm-thick FRP (fiber-reinforced plastic) upper chassis plate strengthens the chassis and doubles as a removable radio tray. For quick maintenance

and routine cleaning, remove your throttle and steering linkage and eight screws, and the radio tray will easily pop off while the servos remain in place.

A plastic, 80cc, quick-fill fuel tank rests in the middle of the chassis. Tamiya includes a fuel filter with the kit. This is a nice touch; although the filter costs only about \$2 at most hobby shops, it's one less thing you'll have to buy and one less trip you'll have to make to the



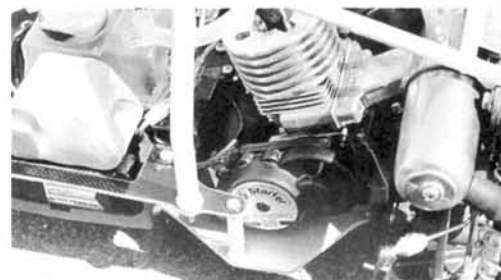
The TR15T is equipped with a set of Stadium Racer Tarmac tires. These are good for basic street running, but as soon as you get up to speed, you'll find that they let you spin out if you push it. An optional set of stickier slicks is on the way.

store when you could be out running your truck instead.

TOPNOTCH TRANNY

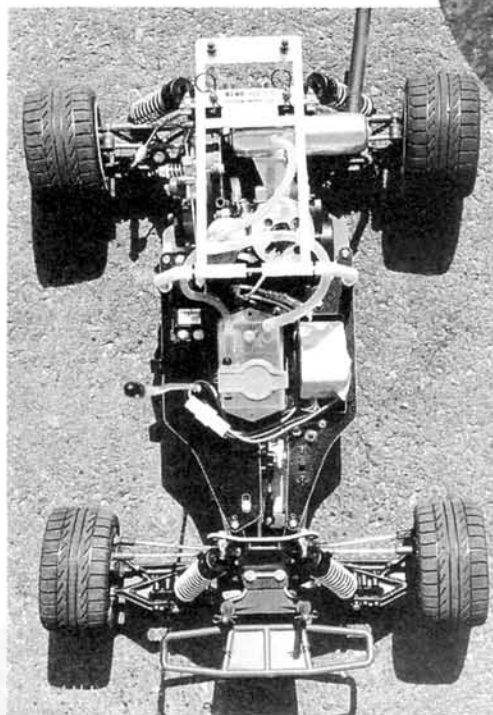
As I said earlier, the TR15T has the same transmission and Multi-Disk Clutch as the Dyna Blaster. The ball-bearing transmission (all ball bearings except for the

bushing that supports the center diff gear) is silky smooth and has an adjustable ball diff. The new diff is adjusted by a screw, a



I tested the TR15T with help from KO Propo's remote EG starter kit equipped with the optional 3-channel remote-control unit. If you have a 3-channel radio, just activate the third channel, and the engine will crank to life.

ball thrust bearing and washers. (Tamiya refers to them as "disk springs.") Tamiya has included a special tool to help you to adjust your diff easily: place the tool between the two diff joints to lock them;



TAMIYA TR15T

Scale.....1/10
List price.....\$760

DIMENSIONS

Overall length.....16.5 in.
Wheelbase.....11.5 in.
Front width.....11.5 in.
Rear width.....12 in.

WEIGHT

Gross (ready to run).....4 lb., 8 oz.

CHASSIS

Type.....Plate
Material.....Duralumin

DRIVE TRAIN

Type.....Sealed gear drive
Primary.....Clutch bell pinion/spur
Transmission.....Universal joint/dogbones
Differential(s).....Ball diff
Slipper clutch.....MDC (Multi-Disk Clutch)
Bearings/bushings.....Bushings and bearings

SUSPENSION

F/R: Type.....Individual A-arm w/adjustable
camber link and sway bar
Damping.....Plastic, oil-filled, coil-over shocks

WHEELS

Front: Type.....One-piece plastic
Dimensions (DxW).....2 5/8x1 1/4 in.
Rear: Type.....One-piece plastic
Dimensions (DxW).....2 3/4x2 in.

TIRES

Front.....Stadium Racer Tarmac
Rear.....Stadium Racer Tarmac

POWERPLANT

Engine.....FS-15
Pipe.....Stock
Carb.....Stock

OPTIONS TESTED

Byron 2000 20-percent-nitro fuel, KO Propo EX-3 radio, KO Propo EG Starter, Team Losi Green shock springs.

HITS

• Parts are of the highest quality • Engine is extremely reliable • Can be run either on or off-road
• It's a blast to drive!

MISSSES

• High list price • Doesn't have all ball bearings • Comes with plastic shocks.

TR15T

then tighten the cap screw to the proper tension. You can use this tool to adjust your Multi-Disk Clutch as well.

The Multi-Disk Clutch uses three clutch disks that are pressed between notched metal inner disks to increase the area of the slipper pad; this produces a more consistent slipper clutch. The system provides very smooth slipping action. A 64-tooth spur gear with the clutch bell's 18-tooth pinion gear provides a final drive ratio of 7.1:1. Another spur gear (66-tooth) is included for converting the truck for off-road driving. If you want to convert your truck, you must purchase Tamiya's optional 16-tooth pinion gear, which provides a final drive ratio of 8.25:1. Why the spur gear and not the pinion gear was included in the kit, I don't know. Kind of odd, huh? Anyway, a large disk brake slips over the Multi-Disk Clutch housing, and the system slows and stops the TR15T in a relatively short distance. An optional disk made of a more resilient, more durable material is also available.

BUILDING TIPS

I thought that this truck would be fairly difficult to build. Well, I'm very glad to say that it went together without a hitch. I'll share a few tips with you, though:

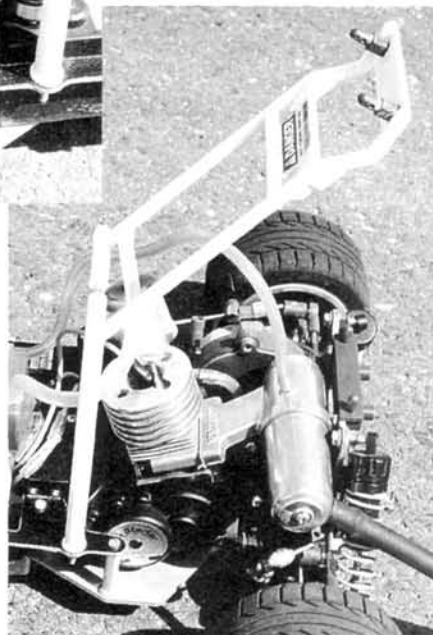


Left: the TR15T is equipped with a disk-brake system that stops it fairly quickly. Tamiya's Multi-Disk Clutch unit comes with the kit.

- First and foremost, before you begin building this kit, read pages 32 through 35 of the instruction manual to familiarize yourself with all the parts. And if you have any doubt in your mind about a specific part while you're building, refer to these pages.

- For the longest time, I couldn't find the spacer BU2 that's used in Step 3. Beside each step in the instructions is a little box displaying the parts used in the step, but the BU2 spacer wasn't shown. I thought it was missing from the plastic parts tree, but if I had become familiar with the parts in the manual, I would have quickly found it in the bag with the two spur gears.

- The parts chart shows that you should put a metal bearing in the center of your differential spur gear. Only when I got to the end of building did I realize that when they say



The heart of the Tamiya TR15T is this .15 powerplant. Note how the truck's roll bar swings upward, allowing full, easy access to the engine.

Converting the TR15T for Off-Road

Because the Tamiya TR15T's basic geometry is almost identical to that of its electric counterpart, the Dyna Blaster, only a few minor changes are necessary to convert this tarmac terror into a dirt slinger. To gain optimum suspension travel, disassemble your shocks and remove all the travel limiters. Another option is to upgrade to Tamiya's aluminum Sleeved Damper shocks, which are found on their 2WD race car, the Dyna Storm.

I opted to run a set of these shocks on my truck, and I noticed a major difference in performance. A poly-type plastic sleeve is inserted directly into

the shock body so that the piston slides against the sleeve instead of against an aluminum shock body,



as with conventional shocks. The action between the plastic sleeve and the piston is ultra-smooth. According to sources at Tamiya, the sleeve should last the lifetime of the shock. I filled my shocks with Team Losi 30WT Silatech oil and used the two-hole Tamiya pistons.

When your shocks have been primed and are ready for some off-road adventures, your next step is to remove

the front and rear sway bars and to equip your rig with some off-road treads. I used a set of Tamiya tires like those

used on the Dyna Blaster, the Stadium Blitz and the Blitz Beetle. If the Tamiya tires don't do anything for you, you can use any popular stadium-truck tires from Pro-Line*, Team Losi, etc.

Now you're getting closer to hitting the dirt. The only other obstacle is your clutch bell's 18-tooth pinion gear. Because off-road tires are larger in diameter, you'll have to compensate for the

gearing change by adding Tamiya's optional 16-tooth pinion gear and the included 66-tooth spur

gear. Once that has been done, you'll be ready to roll.

Although I found that the TR15T handled well off-road and otherwise drove admirably, it isn't quite up to par with some of the full-blown 1/10-scale racing trucks that are dominating the racing scene. To be fair, though, mine was slightly heavier than other TR15Ts, thanks to the KO Propo remote starter system.

But even with the added bulk, I could tell that I wouldn't be able to challenge any Nitro Hawks or RC10GTs.

Keep in mind that this truck was designed to be a total blast, either on or off-road, and it lives up to its design. Yes, you could race this truck (it would take a little work), but racing isn't what it was designed for. If you're looking for a racing-only truck, shop elsewhere; if you're looking for a reliable gas truck that can hit the street or dirt without much hassle, check out the TR15T.



metal bearing, they really mean metal *bushing*. I confused *metal* bearing with *ball* bearing, so I mistakenly placed a ball bearing in that gear instead of the bushing that was supposed to go there.

- When you've completed the diff and it's time to tighten it, be careful. I really cranked on the cap screw, and I broke it in two. Unfortunately, my stupidity set me back a few days until I obtained the replacement part.

- Take your time when you build the Multi-Disk Clutch; it's a very important part of the vehicle.

- When you build your shocks and you put part X2 (the threaded ball-cup end) on the shock shaft, use a little thread-lock on the threaded end of the shock shaft for added strength. I couldn't tighten the shocks all the way; they just kept spinning. I replaced the wimpy stock springs with a set of Team Losi* green springs all the way around.



I replaced the stock Tamiya springs with a set of Team Losi Green springs. They provide a slightly more rigid ride that complements my wild, on-road driving style.

- Remember earlier when I said I was confused about the bearing/bushing deal? Well, when it was time to assemble the clutch, I found myself placing a bushing—instead of a bearing—in the pinion end of the clutch bell. Every time I cranked the engine over, the clutch bell would lock down on the shaft and prevent the clutch from disengaging, and the wheels would move. I had to swipe a bearing from a nearby 4WD Tamiya Top Force to put in the clutch bell.

- When it's time to detail the body and you have to put the stickers on it, be patient—especially with the stickers that go on the side of the body. I'm not kidding; if my girlfriend hadn't been around to keep me calm during this step, I probably would have thrown the body out the window.

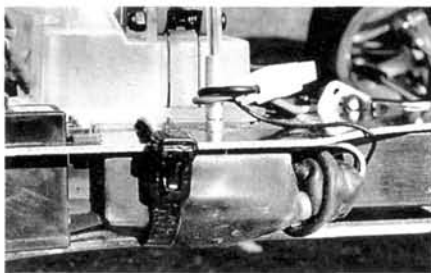
Those are all the things I noticed that I think you should watch out for. With that said, let's get this thing out to the parking lot.

PARKING LOT POUNDING

To test the truck, I decided to run the all-new KO Propo* EX-3, 3-channel, AM radio system and their trick, onboard, remote-control, EG starter system. (For more info on the EG starter system, check out my review in the June '94 issue.) The radio comes with two PS401 servos, and the starter system comes with an onboard remote-control starting unit (slightly larger than a servo). All I had to do was activate the third channel on my radio (a button underneath the steering wheel), and the engine would turn over. It's too cool for words. You'll have to check it out for yourself.

I poured some Byron* 20-percent fuel into the tank, charged my receiver pack, set the needle valve (three-and-a-half turns open, plus two clicks), hit the button on my radio and *braaaahhh!* (simulated 2-stroke noise); the TR15T fired right up and sputtered a puff of white smoke. I took the truck to a local parking lot for a break-in session and ran it extremely rich for the first four or five tanks.

Man, what a blast! Driving the TR15T is so much fun! It didn't exactly take off like a shot, but once it was moving, the little sucker flat-out hauled. After I had broken in and leaned out the engine, I quickly discovered



The receiver rests under the FRP chassis and is protected by an included rubber balloon. A zip-tie keeps it snug.

the limit of the stock, street-tread tires. You can get the TR15T to spin out pretty easily with these tires. According to inside sources at Tamiya, a hop-up set of slick, stickier tires is on the way. Also, after running it for a while, I noticed that the engine tended to run a little hot. I'm going to cut out a section of the front windshield so more air can reach the cylinder head. That should help to lower the temperature a little.

IMPRESSIVE IMPRESSIONS

So, after running it for a while, what do I think? Well, the truck has a few features that I really like:

- You don't have to remove the body to refuel or tune the engine. The roll bar swings back so that you can work on the

HOT FACTORY HOP-UPS

When I began writing this Track Report, I called Tamiya to get some more specifics on the truck. After I had talked to one of the engineers for a little while, he let it slip that Tamiya has been working on a few hop-up parts for the TR15T. Here's a tentative list of hop-up items that are being developed:

- blue- and red-anodized chassis;
- an oversize heat-sink head;
- racing slicks;
- an electric starter system similar to KO Propo's hand-held EG starter.

Rumor has it that Tamiya has also been thinking of offering a big-bore kit that would up the engine's displacement to .16 or .17ci. We'll let you know of any further developments.

engine easily. Attached to the roll bar is a piece of secondary refueling tubing, which, in turn, is connected to the gas tank. You refuel through the tubing.

- A section is cut out of the roll bar where the pull-starter handle is held so that the handle won't flop around and melt on a hot cylinder head.

- Removing the radio tray is simple, and this makes routine maintenance much easier.

- The TR15T is really sturdy; I whacked a curb at a pretty decent speed, and the front bumper absorbed all the impact without even whimpering. During my test session, the only thing that went wrong was that my right rear tire popped off the rim.

PROPER PERFORMANCE

As for its performance, well, it's definitely not a racing truck, but it wasn't designed for that anyway. Backyards and empty parking lots are where this vehicle is most at home. It's even great for off-road (see sidebar). It's a bit pricey, and I think that, for the amount of money you spend on it (it hits most hobby shops at somewhere between \$430 and \$450), the trick Sleeved Damper shocks, extra off-road tires, the 16-tooth pinion and at least a complete set of ball bearings should come with the kit. But even without those extra goodies, I think that you should definitely check this truck out if you're looking to get into gas, or if you're already into it and want something cool that can either zip around your local parking lots or do the doubles on a backyard off-road track.

**Here are the addresses of the companies mentioned in this article:*

Tamiya America Inc., 2 Orion, Aliso Viejo, CA 92656; (714) 362-2240.

Team Losi, 13848 Magnolia Ave., Chino, CA 91710; (909) 465-9400.

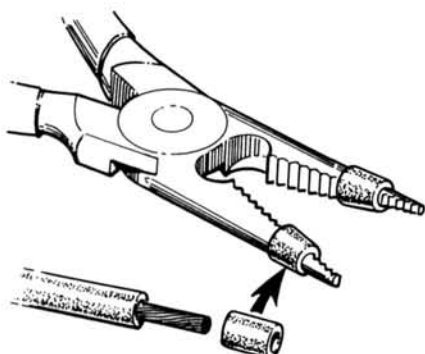
KO Propo, 25-10 Sendagi, 3-Chome, Bunkyo-Ku, Tokyo, Japan.

Byron Originals, P.O. Box 279, Ida Grove, IA 51445.

Pro-Line USA, P.O. Box 456, Beaumont, CA 92223; (714) 849-9781. ■

PIT TIPS

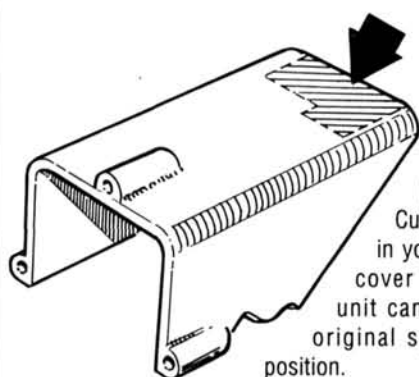
by JIM NEWMAN



NON-DAMAGING PLIERS

To hold hinge pins and shock shafts without damaging their fine finish, cut short pieces of insulation off no. 14 electrical wire, then slip the pieces over the jaws of your pliers.

Paul Bennett, Spokane, WA



ESC FOR BLACKFOOT

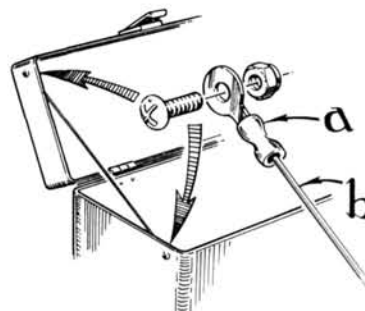
Cut clearance notches in your speed controller cover so that the Tekin unit can be placed in the original speed controller's position.

Kenn Martini II, Deer Park, WA

STRIPPED-SCREW RESCUE

If you strip out the slot or socket of a screw, you can use a fine hacksaw or a cutoff wheel to make a new one. Be careful not to heat the screw and melt the plastic, and always wear eye protection.

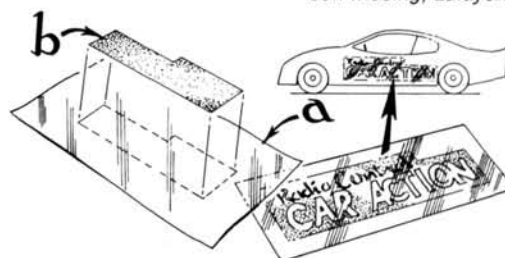
*Brian Karwan,
Painesville, OK*



TOOLBOX LID STAYS

Crimp 1/4-inch, 14-gauge electrical terminals (a) to suitable lengths of lawn-trimmer monofilament nylon cord (b), then use short screws, washers and self-locking nuts to secure the stays as shown. The cords should be just long enough to allow the lid to go slightly back past the vertical position. Now the lid won't fall all the way back and strain the hinges.

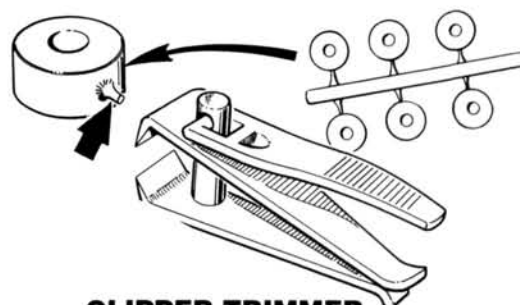
Jeff Mosing, Lafayette, LA



D-I-Y DECALS

Clear, self-adhesive laminating film (a) is available at stationery stores. Cut suitable logos from magazines or ads, and place them (b) face down on the film's adhesive side. Cut out the logos with a sharp knife, leaving a narrow strip of adhesive around each one. Then press them firmly into place on the car.

Sean Corcoran, Cumming, IA



CLIPPER TRIMMER

When you assemble a new car, use toenail clippers to trim the little pips (gates) off the plastic moldings. A couple of strokes with fine-grit (no. 400) sandpaper will provide a smooth finish.

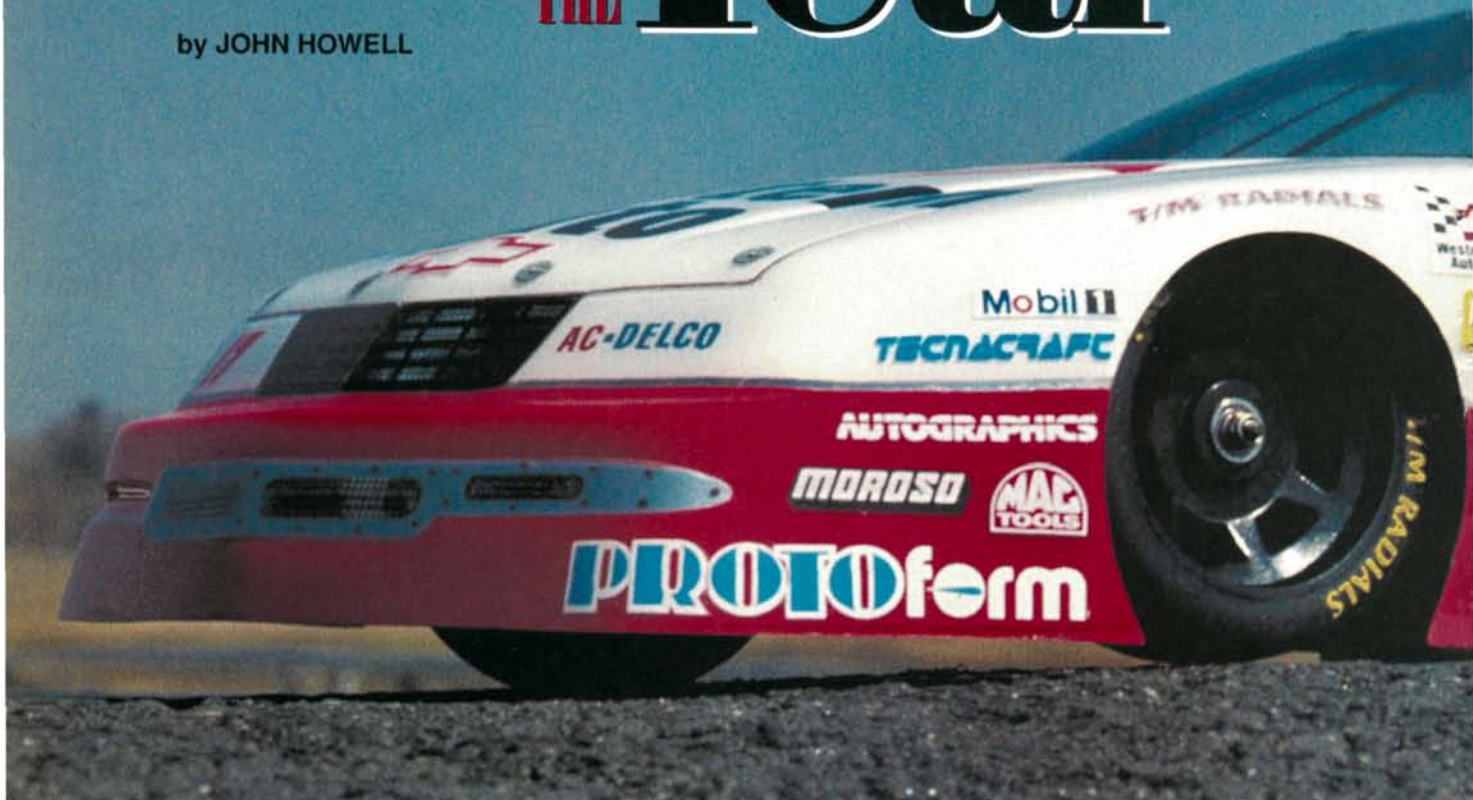
Mark Reardon, Tacoma, WA

(Continued on page 58)

PLEASE NOTE: be sure to print your name and full address clearly on every letter and sketch you send to "Pit Tips." We can't publish many good tips because we don't have the senders' names or addresses.

Radio Control **CAR ACTION** Car OF THE Year

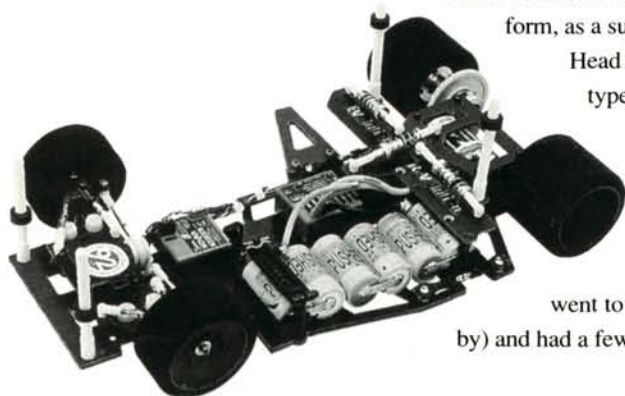
by JOHN HOWELL



IN THE SUMMER of 1992, Trinity*—a company widely recognized for its battery and motor lineup—unveiled its first ever on-road car: the Evolution 10. Piloted by Team Trinity driver Joel Johnson at the IFMAR On-Road World Championships at the Ranch Pit Shop in Pomona, CA, the state-of-the-art Evolution 10 decimated the competition and captured the championship.

Since its introduction, the Evolution 10 has branched into a new form, as a superspeedway version—the EV10ss.

Head Evolution designer Jim Dieter first ran a prototype of the EV10ss at the 1993 Speedworks race at the famous Lake Whippoorwill International Speedway. Not exactly happy with its performance, immediately after the race, Jim subtly reworked and changed its chassis geometry. He then went to Trinity's graphite supplier (who was nearby) and had a few new chassis made that same day.



**JAWIN
WITH
JOEL**

EV10ss Victories

What	Where
TQ'ed and won	'93 Oval Masters at Lake Whippoorwill International Speedway in Orlando, FL
TQ'ed and won	'93 CAM K&N Winter Blast at K&N Speedway, Stafford Springs, CT
TQ'ed and won	PROCAR Mid America Nats at Ameritrac, Mattoon, IL
TQ'ed and won	PROCAR Southern Nats at Lake Whippoorwill International Speedway, Orlando, FL

TRINITY EVOLUTION 10ss

TQ'ed and won	PROCAR World Championships at the PC Hobbies Super Speedway, King, NC
TQ'ed	ROAR Paved Oval Nats at Lake Whippoorwill International Speedway, Orlando, FL
TQ'ed	PROCAR Northern Nats at K&N Speedway, Stafford Springs, CT
Track record	Racer's Haven Super Speedway in Bakersfield, CA
Track record	PC Hobbies Super Speedway, King, NC
Track record	Lake Whippoorwill International Speedway, Orlando, FL



We asked Team Trinity's World Champ driver Joel "Magic" Johnson a few questions about the EV10ss...

CAR ACTION: You've been extremely successful with the EV10ss in its first racing season. Why do you think the

EV10ss has done so well?

JOEL: It has done so well because Trinity has the best line of on-road and oval cars in the industry. Jim Dieter has taken chassis development to the next step. Also, Trinity has assembled the best race team and has the best research-and-development program in the industry today. No other company in on-road or oval racing can say that they do more to better their products than we do. We're constantly coming up with ways to go faster, and we try hard to deliver this to our customers as soon as possible.

CAR ACTION: When or under

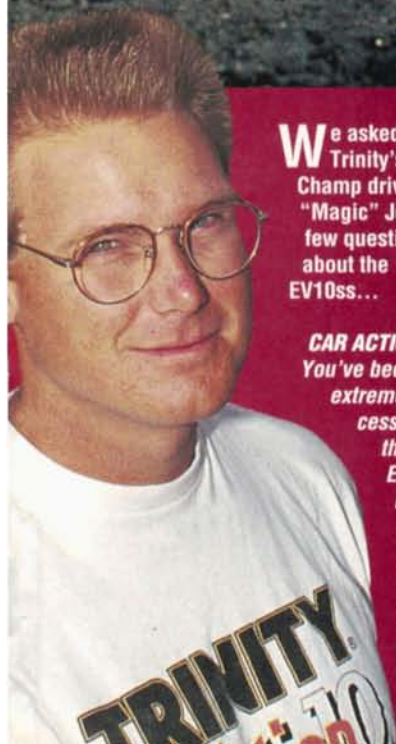
what track conditions do you prefer to use the LSD [Trinity's left-side-drive car] instead of the standard EV10ss?

JOEL: I prefer it more on large ovals than on short ovals—especially large, banked ovals.

CAR ACTION: The EV10ss is one of the most complex and adjustable superspeedway cars on the market. Do you think that its complexity might be a little overwhelming for novices?

JOEL: The EV10 line is complex, and at first it might be somewhat overwhelming to a novice racer, but we didn't want to settle for something

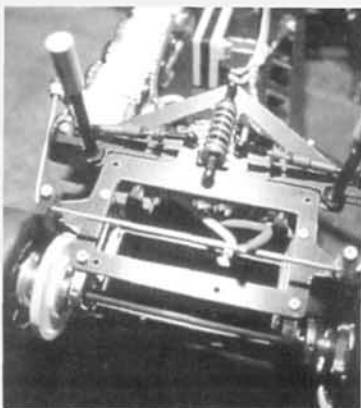
less than what the EV10ss delivers performance-wise. Any car with the features it offers will seem tough at first, but, in the end, it will reward the driver by being a consistent winner. We have done our best to try to include as much information in the instructions as possible to help people tune the car at the race track. Another way we're trying to help is by producing a series of videos on the cars. The first one is on basic setup and assembly; the next will be on advanced setup tips; then a driving video. Through this series of videos, we hope to arm our customers with all the information they need to achieve success at the track.



Left-Side-Drive Car

At the inaugural PROCAR World Championships at the PC Hobbies Super Speedway, a few Team Trinity drivers tested an all-new version of the EV10ss. Designed by Jim Dieter earlier in '93, the car featured a new rear pod that was equipped with a left-side-drive system. According to Jim, the "LSD car"—as it's now called—was designed to put the power to the ground much more easily than a conventional setup.

With the motor on the left, weight is biased toward that side of the car, and that's beneficial when the car gets up to speed. As a superspeedway car gains speed on an oval, it encounters



greater G-force that tries to lift the inside tires off the track. Because of the track's bank, the car's weight is transferred from its left to its right, and putting the motor on the left helps to counter this. What are the handling benefits? Well, according to Dieter, the car has more bite coming out of corners, so you can get on the throttle much sooner—especially on slicker tracks.

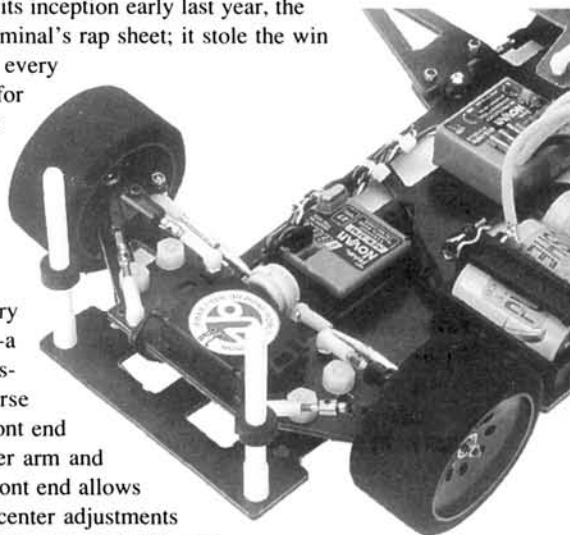
The LSD car is now available from Trinity as a conversion kit and as a complete car kit—the World Champion Limited Edition Speedway kit, which comes with a reverse-rotation Slot Machine 2 stock motor.

Without testing the new car, Jim and the rest of the team packed up and drove to Connecticut for the K&N Winter Blast race. Finding themselves with virtually no track time and about to race an untested car, they were all slightly apprehensive. But their fears were put to rest because they quickly found that Dieter had calculated correctly and had come up with a winning formula. The outcome? Joel won convincingly.

Since then, the superspeedway version of the Evolution 10 has proved itself to be the car to beat. Since its inception early last year, the EV10ss's racing success reads like a criminal's rap sheet; it stole the win or top qualifying position in just about every race in which it was entered—not bad for its first year on the track. Let's look at some of the car's finer points.

Radical RCS

The EV10ss has a highly adjustable, very high-tech front-suspension system—a narrower Reactive Caster Suspension system similar to the one on its roadcourse brother, the EV10. The EV10ss RCS front end is equipped with a carbon-graphite lower arm and fully adjustable upper links. The RCS front end allows quick and easy caster, camber and roll-center adjustments by way of the adjustable upper links. By design, when the car enters a turn and its suspension is compressed, caster is decreased, and that, in turn, improves front-end traction and stability through the turn. Damping is provided by kingpin-mounted coil springs and by coating the kingpins with silicone fluid.



The Champ's Chassis

The backbone of any car is its chassis, and the rigid graphite chassis on the EV10ss is one of the most versatile on the market. The left-side battery-mounting system allows the cells to be installed more toward the center of the car or more toward its left side. Putting the cells in the outer position increases cornering on flatter oval tracks; mounting them further in allows faster steering response and decreases chassis roll. Another hot feature is that you can alter the chassis' wheelbase by placing the front suspension in one of three different sets of chassis holes. Being able to alter your wheelbase is an advantage if you run on tracks of different sizes; a long wheelbase is sometimes beneficial on long tracks, whereas a shorter wheelbase will excel on smaller, tighter tracks.

Tried and Trued Tires

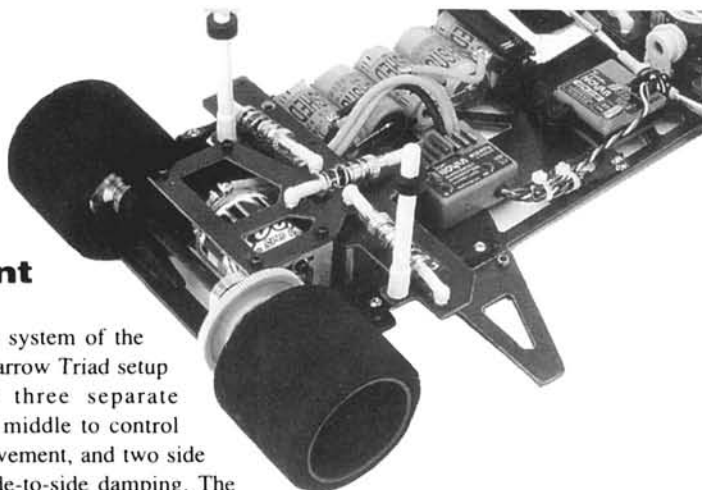
A set of TRC, green-compound, foam, Pro Cut tires mounted on TRC ZR-1 rims comes with the kit. Though they're ideal for indoor carpet-oval racing, on outdoor paved ovals, most racers run capped tires, which TRC also produces.



CAR OF THE YEAR

Triumphant Triad

The rear suspension system of the EV10ss features a narrow Triad setup that incorporates three separate shocks—one in the middle to control fore-and-aft pod movement, and two side shocks to handle side-to-side damping. The pod is attached to the chassis with a single, central pivot ball that allows it to move freely. Two offset, adjustable control links—one on each side—keep the pod centered. A graphite rear axle and aluminum hubs reduce unsprung weight and rotating mass. A fully adjustable ball diff uses a Magic Motorsports* spur gear that locks the pressure washers into place so that you can remove the entire differential intact, if you want to.



The Video—Joel TV

It's no secret that, while the design of the Evolution cars is somewhat complex, Trinity didn't want to settle for second best, so to help people build and tune them, they offer a video. It stars Joel "Magic" Johnson, who teaches all the hot setups and tells how to adjust your car properly.

The video starts with the Reactive Caster front end. Joel shows how to assemble and tune it—everything from which threads go where to how much caster and camber are



recommended. This should clear up any questions.

From there, Joel goes on to cover proper shock assembly: how to fill them and bleed out any trapped air bubbles; then he shows how to adjust your rear links so that the suspension pod doesn't bind.

In the last part of the video, Joel discusses the basic EV10 and EV10ss setups—everything from camber, caster and rear-spring preload to how much cross-weight to run.

If you recently bought a Trinity EV10, EV10ss, or LSD car, you'll find this video (the first in a series from Trinity) a great help with building and tuning it.

While we were discussing this year's possible candidates for *Car Action's* "Car of the Year" choice, we always went back to the EV10ss. For a car to be so dominant on the racetrack in its first year is an impressive feat. How can you argue with its list of wins! It's also one of the most advanced super-speedway designs on the market, and Trinity is continually trying to improve it, so we're sure you'll see why we unanimously voted the Trinity EV10ss the 1994 "Car Action Car of the Year." Congratulations to Trinity's design team and to all those who were involved with the car's development.

*Here are the addresses of the companies mentioned in this article:
Trinity Products Inc., 1901 E. Linden Ave.
#8, Linden, NJ 07036; (908) 862-1705.
Magic Motorsports, a subsidiary of Trinity Products (address above).

TEAM LOSI TIRES:



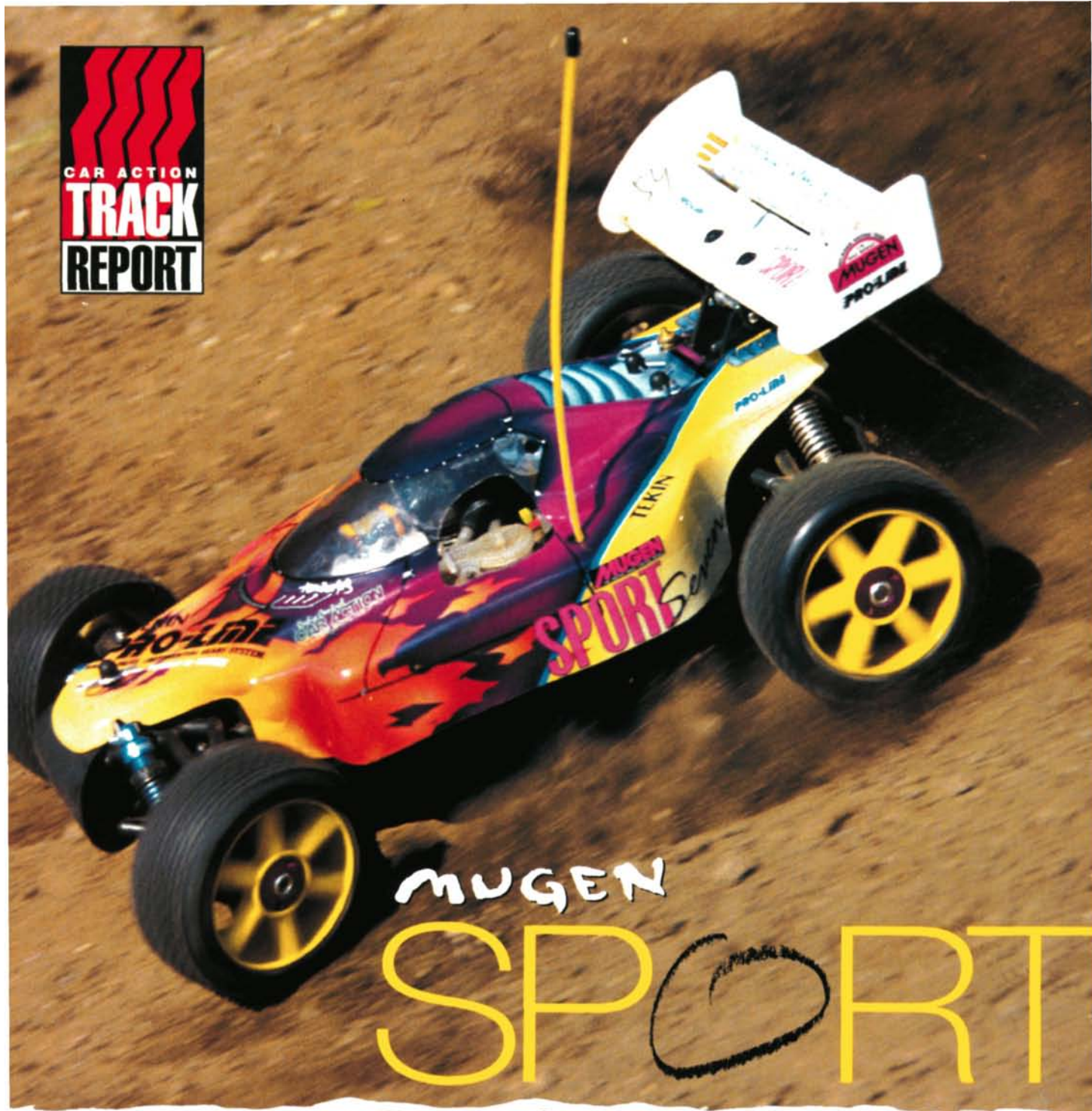
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SEVEN

BY GEORGE GONZALEZ

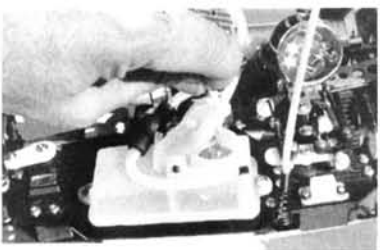
THE SPORT SEVEN is Mugen's latest offering in the 1/8-scale gas arena. Although it's called an entry-level car, about the only thing entry-level on this Mugen is its price.



The Sport Seven uses the same beefy suspension arms as the '93 Super Sport. The aluminum-body shocks come partially assembled.



A six-port, pull-start, Brat .21 engine provided the power for this 1/10-scale terror. The clutch, manifold, tuned pipe, air filter (which was replaced with a K&N unit), fuel line, throttle and brake linkage are included with the kit.



A large spring located in the pressurized fuel tank secures the lid so you won't have to worry about fuel splashing out.

GETTING STARTED

When it comes to building the Sport Seven, don't let the term "entry-level" fool you. If this is your first 1/10-scale gas car, set aside a few evenings to read the instructions in detail before you start to assemble the car. The Sport Seven is a very sophisticated piece of

machinery, and it will take more time to build than a 1/10-scale car. The instruction manual is written in a primitive form of English, and it can get pretty confusing at times! Fortunately, there are plenty of excellent photographs which, if examined closely, make up for the inadequate text.

The only tools you'll need are a medium and a large Phillips screwdriver and pliers. The rest of the tools are included in the kit. You'll also need liquid thread-lock, e.g. Red Loctite*, so that the screws won't become loose. (It's amazing how much vibration a .21 powerplant can produce!)

The folks at Mugen have taken the time to build the diffs and the wheel hubs for you. The shocks also come assembled, so all you have to do is add the shock fluid and install the springs, cups and collars; this will save you at least an evening of work.

RACE-PROVEN CHASSIS AND DRIVE TRAIN

The Sport Seven uses a very trick 4mm Duraluminum chassis plate that's extremely rugged. Optional molded stone guards (part no. AD-51) protect the car's muffler, electronics and drive train from the elements. The drive train consists of three high-quality planetary differentials with steel gears and aluminum housings. Unlike most 1/10-scale, off-road cars, the Sport Seven's center diff is toward the rear, and it's directly connected to the rear diff using a short, steel, bevel gear. An extra-long center shaft links the front and center diffs. To ensure the smoothest possible drive-train operation, 10 high-quality ball bearings are included. The engine rests on a set of adjustable, aluminum engine mounts that position the engine in the center of the chassis with the exhaust outlet facing forward and the pipe facing the rear. A single, large, fiberglass disk brake is connected to the center diff; it provides excellent stopping power for the front and rear tires.

I was looking for that competitive edge, so I installed a front disk-brake set (part no. AB-

Body and Wing



The Sport Seven comes with an awesome-looking Lexan body and a heavy-duty nylon wing. The folks at Air Works* came up with the radical flame paint job that you see before you. I have to admit that I was afraid to drive the car because I didn't want to scratch the paint!

I cut out openings in the body for access to the fuel tank and the pull-starter. I also cut an opening on the side of the driver's window to allow air to cool the engine's heat-sink head. While I was at it, I drilled a hole on the top of the body to access the glow-plug igniter, and one on the side to access the fuel/air-mixture needle valve. I can now use the pull-start and tune the car without removing the body. The nylon wing is a big plus because it's much stronger than a Lexan wing, and it will last much longer. (You can also adjust the wing to increase or decrease downforce.)

12D). The front disk brake is mounted on the hex-shaped drive of the center diff, and no modifications are necessary. The disk-brake

Really cool wheels

The Sport Seven comes with a set of cool-looking, light-weight rally wheels that are deeply offset inward for better handling with less wheel scrub. (They can also be dyed for that personal touch.) The kit includes a set of medium-compound, 5-row, spiked tires that are suitable for soft- to medium-packed dirt. The Sport Seven uses standard 17mm hex-nut wheels, which

makes it compatible with the most popular wheels and tires. I decided to install a complete set of Mugen's Super Sport 6-spoke racing wheels and a set of Pro-Line* mini-pin-spoke tires (they're better suited to hard dirt surfaces). While I was at it, I replaced all the wheel bushings with bearings, which the folks at Mugen kindly supplied.



set comes with all the necessary hardware, and it includes a set of rugged tie rods that replace the kit's piano-wire linkage.

The chassis is reinforced with a set of front and rear aluminum upper braces. The front upper brace supports the front diff and the steering bellcranks, and the rear upper brace supports the center and rear diffs. The Sport Seven's chassis and drive-train layout is well-designed for weight purposes. With the center diff toward the rear, you can use shorter throttle and brake linkages to improve the response.

RADIO TRAY

All the radio equipment, i.e., steering and throttle servos, receiver, receiver switch and antenna, are mounted on an aluminum radio tray, or "mecha deck" as it's referred to in the manual. The receiver, which is suspended by a thick rubber band to isolate it from vibration, allows direct access to the crystal for quick frequency changes. Because the receiver is mounted next to the fuel tank, I'm thinking about ordering a receiver case (part no. D-C) to protect it from fuel spills.

The Sport Seven seemed right at home with the brutal track conditions; there wasn't an obstacle that it couldn't handle.

.....

A really trick, pressurized fuel tank that's designed to get every last drop of fuel to the engine is also mounted on the radio tray—dead center on the chassis. Unlike most mousetrap-type fuel tanks, the Sport Seven's quick-fill fuel tank has an inner spring that pulls the filler cap down from the inside. The entire radio tray is mounted on the chassis with molded-plastic posts, and it can be easily removed for maintenance.

SPORT SUSPENSION

The Sport Seven's front suspension consists of beefy upper and lower A-arms that pivot on oversize hinge pins on the molded diff case. Molded steering hubs, with the axle shafts and metal bushings installed, connect the upper and lower A-arms. For increased strength, a short tie rod is connected to the upper and lower A-arms, and this prevents the arms from

separating during a collision. Hard, steel dog-bones transfer the power from the diff out-drives to the front axle shafts. Mugen offers a set of universal-joint half-shafts (part no. AU-12A), and I plan to order them soon!

The Sport Seven's front caster and camber are adjustable. The caster is varied by means of shims on the upper arms, and it can be set to either 10, 15, or 20 degrees of negative caster. Camber is varied by the position of the eccentric upper mounting cups that secure the steering hubs to the upper arms. There are three preset camber settings.

The Sport Seven comes with a set of aluminum-body, oil-filled shocks and progressive-type springs. The shocks might not be hard-anodized, but they seem to work quite smoothly just the same. The shocks come assembled with the two-hole shock pistons already installed. I filled up the shocks with the supplied shock fluid and installed the progressive springs. For easy adjustments, the shocks also come with several quick-adjust spring collars in various widths. One side of the shocks is bolted to a sturdy aluminum shock tower, while the other is bolted to the lower A-arms. A heavy-duty front bumper is installed on the front diff case, which pro-

protects the front suspension from damage caused by occasional wipeouts.

It all sounds pretty straightforward, but the instructions have a funny way of making it all seem so complicated. The problem is that the steering hubs are plainly stamped "right" and "left," which is a no-brainer, but the A-arms are stamped with either a "1" or a "2," instead of left and right. This is where the confusion starts. If you read the instructions carefully, however,



The entry-level Mugen Sport Seven 1/8-scale buggy is an admirable performer right out of the box that can be upgraded to a full-blown race vehicle.

MUGEN
PRO-LINE

Nitro

Specifications

SCALE 1/8
LIST PRICE: \$391.99 (w/o engine),
\$558.99 (w/.21 pull-start engine)

DIMENSIONS

Overall length 17.5 in.
Wheelbase 12 in.
Front width 12 in.
Rear width 12 in.

WEIGHT

Gross (ready to run) 7 lb., 5 oz.

CHASSIS

Type Aluminum plate
Material Duraluminum

DRIVE TRAIN

Type 4WD
Primary Pinion (clutch bell)
and spur
Differential(s) 3 planetary
Bearings/bushings Bearings
(drive train), bushings (wheels)

SUSPENSION

F/R: Type Upper/lower A-arms
Damping Oil-filled, coil-over shocks

WHEELS

F/R: Type 17mm hex-nut,
molded rally wheels
Dimensions (DxW) 4.125x1.75 in.

TIRES

(F/R) 5-row spike

POWERPLANT

Engine Brat .21 6-port pull-start
Pipe Mugen tuned pipe
Carb Brat slide valve

OPTIONS TESTED

Airtronics Caliber 3P transmitter, Pro Series 94152 high-torque steering servo, Pro Series 94151 high-speed throttle/brake servo, heavy-duty servo arms, battery/receiver switch, Tekin TFM-75

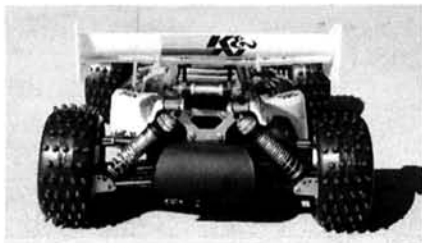
micro FM receiver, PTI 5-cell 600mAh receiver battery pack, Mugen wheel bearings, Mugen front brake set (no. AB-12D); Mugen Super Sport 6-spoke racing wheels, Pro-Line 9010 mini-pin tires, K&N air filter (no. 62-2470), Lunsford* titanium tie-rods.

HITS

- Killer looks and performance
- Race-proven chassis design
- Superb steering bellcrank system
- Quick-fill fuel tank
- Unlimited upgrade potential
- Excellent factory support

MISSSES

- No rear anti-squat and toe-in adjustment
- Instructions could use some clarification
- Difficult to remove roll pins from wheel hubs for maintenance



For added protection, the Sport Seven has a large rear bumper.

you'll find that each side of the suspension has a no. 1 arm and a no. 2 arm.

The rear suspension consists of upper and lower A-arms that pivot on hinge pins on the rear diff case. Molded rear hubs (with metal bushings and axle shafts already installed) tie the upper and lower A-arms together. Hardened-steel dogbones transfer the power from the diff outdrives to the axle shafts, while extra-long, aluminum-body, coil-over shocks provide damping. A heavy-duty rear bumper protects the rear suspension from rear-end collisions. You can adjust rear camber easily by tightening or loosening the metal endpiece of the upper arms. (Tightening increases negative camber; loosening it gives positive camber.) Unfortunately, no rear toe-in or anti-squat adjustments are possible.

The rear suspension is far less complicated than the front, and you shouldn't have any problems putting it together. (Every part is plainly stamped "left" or "right"!)

Mugen offers an optional rear stabilizer bar (part no. A-14R) that will improve handling. When your budget allows, you can also replace the metal wheel bushings with bearings (part no. SC-17A).

STEERING SYSTEM

The Mugen uses a twin-bellcrank/servo-saver system that's really trick. Each front tire has its own steering bellcrank and servo-saver. Each bellcrank pivots on an aluminum post that's threaded to allow for an adjustment nut, which is used to adjust the servo-saver's tension spring. The steering linkage coming from each steering hub is connected to its own servo-saver, and both servo-savers are connected with a single tie rod. The system works incredibly well and virtually eliminates bump-steer.

WILD HORSES

The Sport Seven can be purchased with or without an engine. My kit came with a Brat .21, six-port, pull-start engine; a clutch; a manifold; a tuned pipe; an air filter; a fuel line; and all the throttle- and brake-linkage hardware. I installed my electronics: an Airtronics* Caliber 3P transmitter, a Tekin* TFM-75 FM micro receiver, an Airtronics Pro Series 94152 steering servo, a Pro Series 94151 throttle/brake servo and a PTI* 600mAh, 5-cell receiver battery pack. I

mounted the battery pack on the chassis. (I didn't use the kit's aluminum battery-mounting tray.) I also replaced the kit's paper air filter with a high-performance K&N* air filter. At this point, the only thing holding me back from some serious nitro-powered action was a glow plug, a glow-plug igniter and fuel.

TRACK TIME

I grabbed my gear and headed out to the Fast Action Race Track in Canyon Country, CA. A recent earthquake had damaged the area, but the track was still in good condition.

It took quite a few tugs on the pull-starter to breathe life into the big block .21 engine, but after the initial start, it only took a couple of tugs to crank it back up. The Brat .21 engine's rich setting is factory-set. *Whatever you do, don't mess with the low endpoint adjustment on the carb.* To break in the engine, I ran about five tankfuls of 15-percent nitro at an extremely rich setting. I ran at moderate speeds and, after a quarter gallon of fuel had been run through the engine, I started to lean it out. When I was certain that the engine had been broken in properly, it was time to rock.

The Sport Seven seemed right at home with the brutal track conditions; there wasn't an obstacle that it couldn't handle. Handling was very predictable, and stopping power was tremendous. To increase the car's handling on this particular track, I could have made a few changes in my setup, but I adapted my driving style instead, because I was having way too much fun to stop! After a full day of racing, it was time to pack my bags, but I left the track with a good feeling about the Sport Seven.

AUTHOR'S NOTES

It seems that entry-level cars just keep getting better, and the Mugen Sport Seven is probably one of the best entry-level 1/8-scale gas cars available. To compete with this buggy, the only parts you'll really need are bearings. Of course, if you're a die-hard racer, you can add a front disk brake, front universal dogbones and a rear stabilizer bar. The point is that you can upgrade the Sport Seven as much or as little as you want, and you'll be pleased to find that even in its box-stock form, the Sport Seven performs incredibly well.

**Here are the addresses of the companies mentioned in this article:*

Mugen USA, 7021 Veterans' Ave., Brooklyn, NY 11234; (718) 251-7660.

Loctite Corp., 4450 Cranwood Ct., Cleveland, OH 44128.

Airtronics Inc., 11 Autry, Irvine, CA 92718; (704) 830-8769.

Tekin Electronics, 940 Calle Negocio, #140, San Clemente, CA 92673; (714) 366-9016.

PTI, 331 Shellybrook Dr., Pilot Mountain, NC 27041; (910) 368-1375.

K&N Engineering Inc., P.O. Box 1329, Riverside, CA 92502.

Pro-Line, P.O. Box 456, Beaumont, CA 92223; (714) 849-9781.

Air Works, 57 Valley St., Adams, MA 01220; (413) 743-5919.

Lunsford Racing, 619 First Ave. E., Albany, OR 97321. ■

ADVERTISEMENT

Team Losi TECH TALK

GET A GRIP

Team Losi has recently developed two new tires for use on monster or stadium trucks. The new IFMAR Pin rear truck tire is based on the design of the race-proven IFMAR Pin buggy tire. This tread pattern, which works best on hard-packed, dusty and slippery conditions, is constructed on the popular Diamond Series carcass that has made the Team Losi truck tires a choice of winners everywhere. The IFMAR Pin truck tire is only available in the increasingly popular Gold compound. The part number is A-7638G, and the price, which includes a foam liner, is \$17.95.

Team Losi also has a new front tire to go with the new rear tire. The Low Profile front monster truck tire features an offset rib design. This allows the tire to be mounted in one of two directions so that the steering can be adjusted slightly. These new tires just flat outsteer the competition. They have more steering than any of the other Team Losi tires and are best suited to high-bite conditions that require a great deal of steering. The Low Profile front tires are available in both H.T. and Gold compounds. Both versions come with foam liners. The part numbers are A-7504 for the H.T. compound and A-7504G for the Gold compound. The price is \$17.95 each.

NO SQUEAKING!

If you run on a dusty track and notice that the suspension squeaks after a while, chances are that the squeak is coming from the hinge pins. The hinge pins and arms are very easy to clean. First, remove the hinge pins and arms from the car. Then, take a piece of crocus cloth or a Scotchbrite® pad and clean the hinge pins.

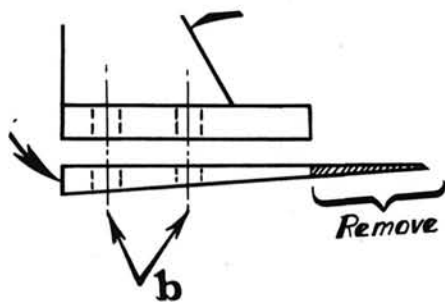
The holes in the arms and the holes in the suspension mount should also be cleaned. This is very simple. Find either a 1/8-inch pipe cleaner (found in the tobacco section of your local grocery store) or an old eye makeup brush (the round spiral kind). By passing the pipe cleaner or the makeup brush through the holes in the plastic parts, all of the dust will be removed. Replace the arms and hinge pins.

If the squeak still occurs, it could be coming from the ball cups on the camber link. If you're using "foam things", try putting a small amount of grease in the ball cup after thoroughly cleaning the ball stud and the ball cup.

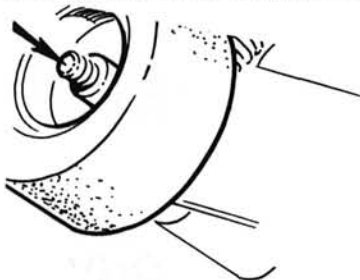
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Let us know what's going on! Address your questions and problems to Team Losi, "Tech Talk," 13848 Magnolia Ave., Dept. J, Chino, CA 91710.

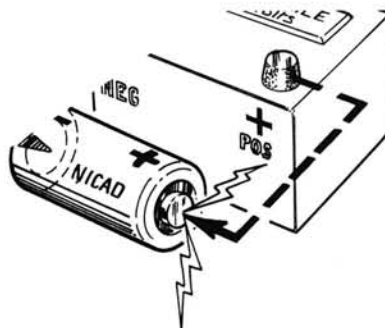
(Continued from page 42)

**RC10 OR 10T CASTER**

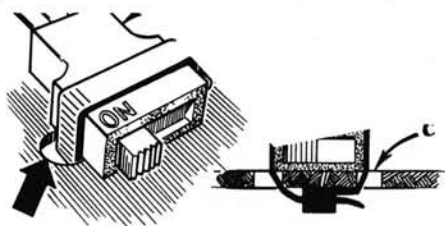
The 10L caster shims (a) have the same hole spacing (b) as the suspension blocks (c) for the RC10L and the 10T. They fit below the blocks, but you'll have to remove the overhang as shown. Now you can add up to 4 degrees of extra caster. *Michael Bielert, Winnipeg, Manitoba, Canada*

**MAKE-DO HUB NUT**

A spare servo arm can often be used as a temporary hub nut. Just enlarge the center hole slightly, then twist it firmly onto the axle. *Joe Choo, Methuen, MA*

**CHARGE/DISCHARGE CODE**

Some power plugs, such as the Super-Cons or Sermos, can be snapped together. Leave them together to indicate that the batteries have been charged and are ready to go; leave them apart to remind you that they have to be charged. *Adam Foote, Tolland, CT*

**RC10 OR 10T ESC SWITCH**

Mount the Novak power switch (a) with a nylon tie-wrap (b) that goes around the switch and through the existing chassis holes (c). *Jason Bimmeler, Ansonia, CT*

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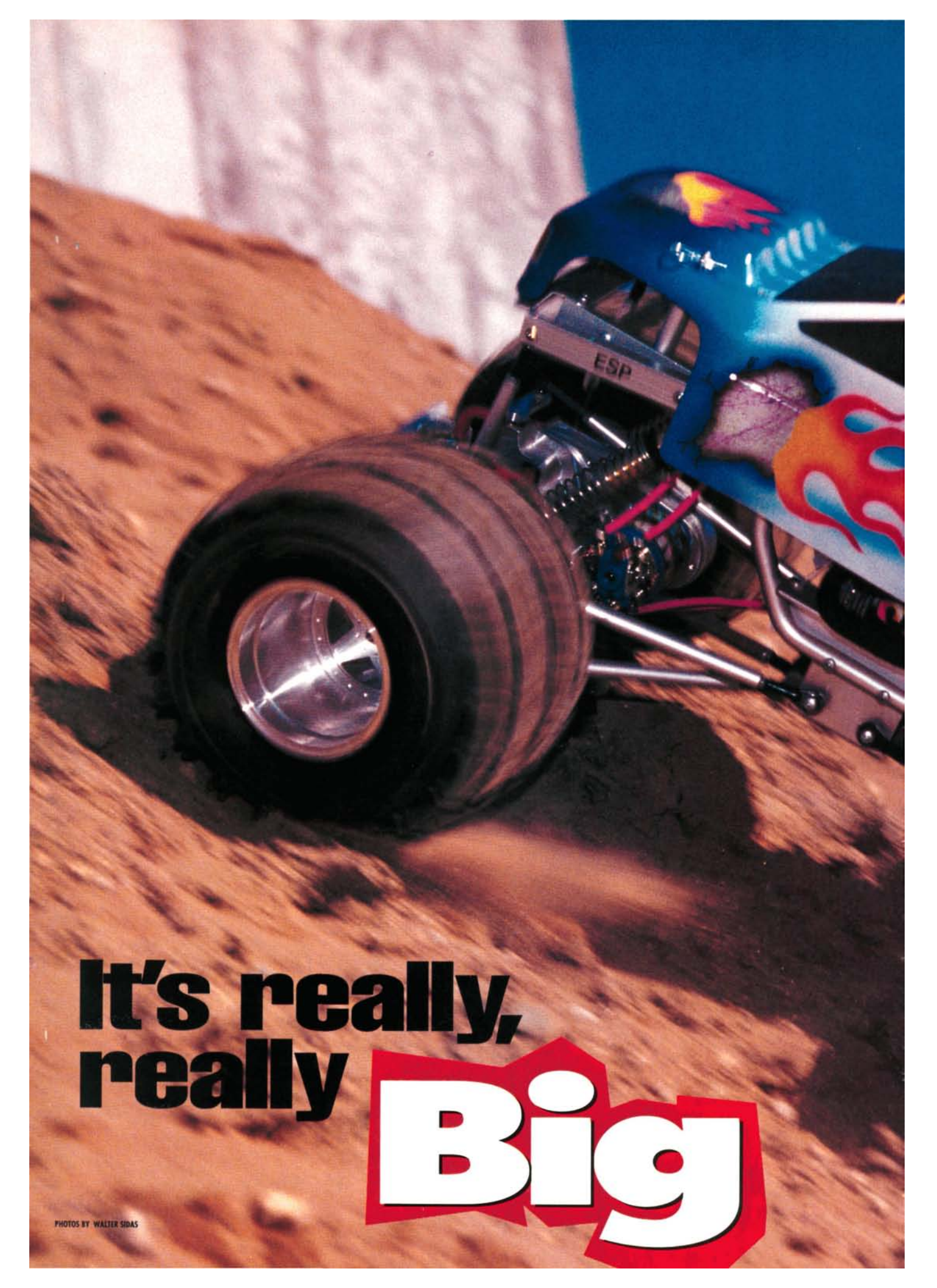
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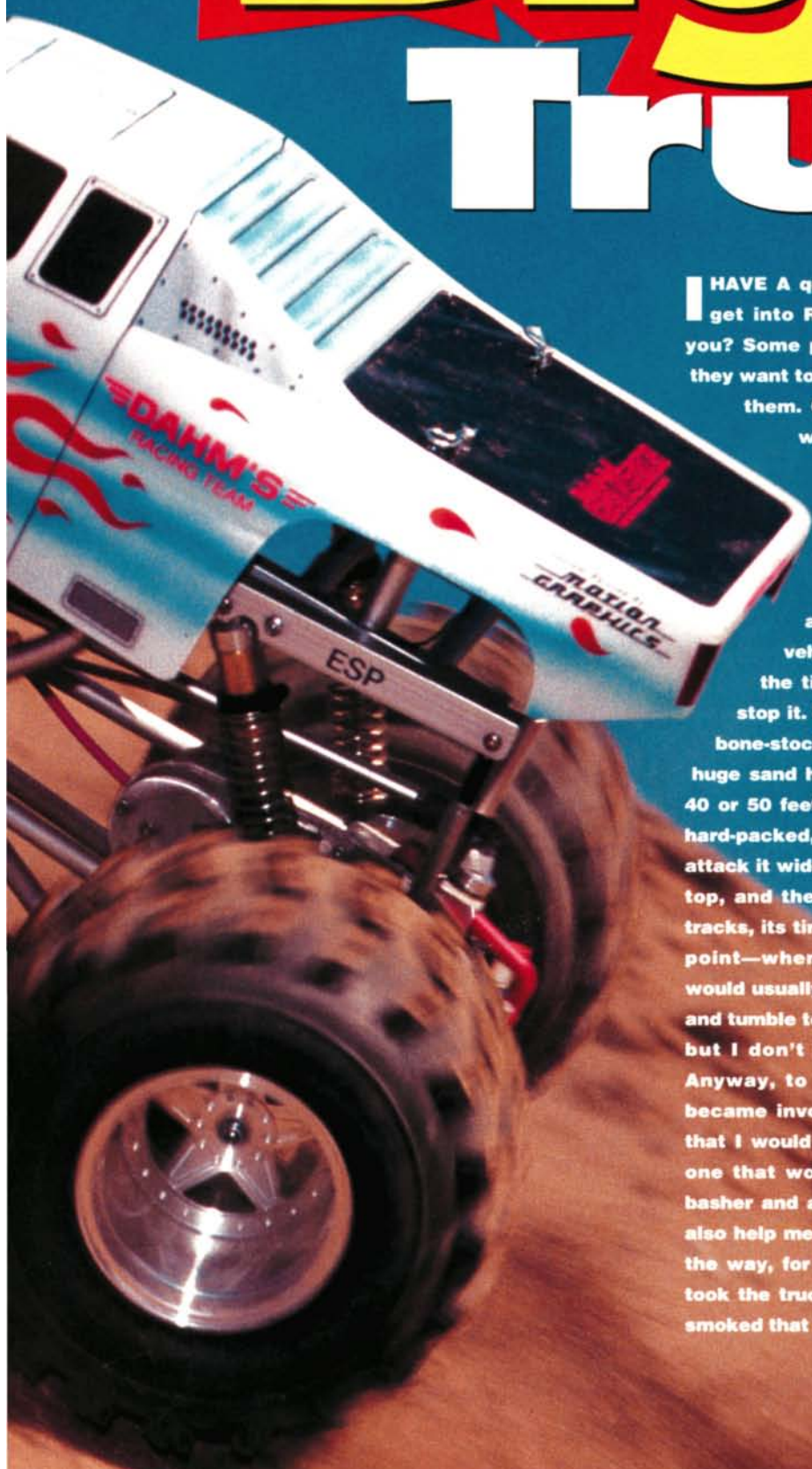


**It's really,
really**

Big

PROJECT **Big** Truck

by JOHN HOWELL



I HAVE A quick question for you. Why did you get into R/C cars? What initially interested you? Some people get into it strictly because they want to race; the intense competition grabs them. Others, like me, tend to kick back with their R/Cs and bash around in their backyard, climbing obstacles, or hitting trees. Yeah, hitting trees.... I'm definitely one of those people.

I got into R/C in the early '80s, and one of my favorite bashin'-type vehicles was Tamiya's* Clod Buster. At the time, I didn't think that much would stop it. When I got my Clod Buster, I kept it bone-stock, and I persistently tried to climb a huge sand hill near my house. The hill rose for 40 or 50 feet at a semi-steep angle, and it was hard-packed, sandy, rutted and bumpy. I would attack it wide open and get about halfway to the top, and then my Clod would stop dead in its tracks, its tires spinning aimlessly. It was at this point—when I tried to turn it around—that I would usually screw up, and it would catch a rut and tumble to the bottom of the hill. I kept trying, but I don't think I ever made it to the top. Anyway, to make a long story short, when I became involved with this magazine, I vowed that I would build the ultimate monster truck—one that would not only be a great backyard basher and a blast to drive, but one that would also help me to get to the top of the hill. And by the way, for those of you who are interested, I took the truck home with me one weekend and smoked that stupid hill...finally.

ESP

Clodzilla II Long-Wheelbase Aluminum Racing Chassis

In building a beast of a truck, your first step is to replace the stock plastic chassis. The plastic, tub-type Bullhead chassis is prone to breaking in crucial suspension areas. When it comes to after-market frames, you want a reliable one of lightweight aluminum. Now, there are a lot of chassis out there, and after some research, I opted for ESP's* Clodzilla II long-wheelbase aluminum racing chassis. The ladder-type frame is much stronger than the stock plastic chassis, and it's also very light. The chassis has two main frame rails with

steering rods that go between the servo and the servo-saver on each gearbox.

The 6063 T-5 silver-anodized aluminum chassis wears well and doesn't oxidize in wet or snowy conditions. It's built with convenient front bumper mounts and a radio tray, and it also has a place to mount the original truck's power/economy switch if you so desire. You can remove the radio tray and mounts as well. It's a very user-friendly chassis!

Another benefit? The battery pack is placed lower in the chassis, and this gives the truck an overall lower center of gravity. Your battery options are wide open. The truck can carry up to two batteries from 6-cell stick packs to

7-cell hump packs. A low CG is crucial when you're driving a monster truck; you don't want to tip over every time you attempt to turn.

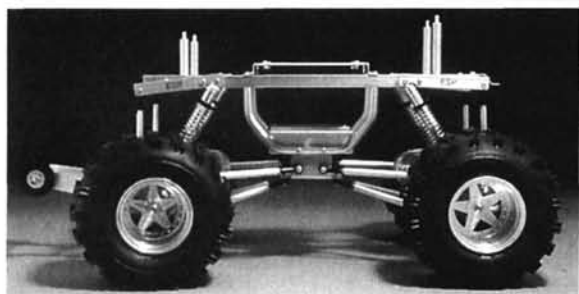
The biggest problem with the stock chassis is the suspension—or lack thereof. The red plastic supports on the bottom of the stock chassis limit the suspension's travel and independent action. They're also one of the key culprits on the chassis that are susceptible to breaking. The ESP Clodzillalever Floating

Shock System and Clodzilla II chassis eliminate the problem altogether. Aluminum links replace the stock suspension, and they allow much greater independent-suspension action as well as more wheel travel. The kit also allows you to use longer shocks, and this means more suspension travel, too.

The way the Clodzillalever suspension works is simple. The shock is compressed from both ends, and this creates a true rising-rate action. This allows the suspension to be soft on initial compression to handle the smaller bumps and to become progressively stiffer to handle larger bumps or landings from jumps. The system also significantly lowers the truck's ride height, and this contributes to the truck's low center of gravity.

The bump-steer in the stock suspension is virtually eliminated with the Clodzillalever suspension because the caster stays constant throughout the suspension travel. The stock motor support arm that was originally attached to the gearbox is eliminated; this is good because it's susceptible to breaking. When you're running hot modified motors in the stock gearboxes with the stock chassis, the gear cases will roll fore and aft, and this could easily break the L-support bracket.

To top off the chic chassis, I added ESP's heavy-duty tie-rod and steering-rod kits. For those of you who are interested in building this truck, I recommend that you go the same route and get these kits as well.

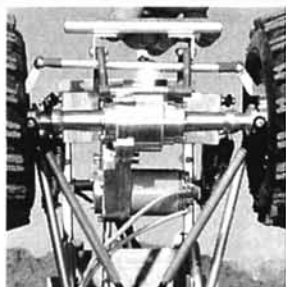


four cross-members—thus, the designation, "ladder" frame. Owing to the chassis' configuration, it's easy to work on the truck, e.g., ESC adjustments, motor and servo changes, receiver mounting and battery changing.

The long-wheelbase kit, which is 13½ inches from axle to axle, has more straight in-line stability, better tracking and can make use of four-wheel steering. The kit also comes with two long, ¼-inch-diameter, heavy-duty, aluminum

To complement the all-aluminum JPS gearboxes, I added a set of JPS's 6061 aluminum axle tubes. The tubes accept the stock axle bearings and stock or after-market axles. Designed for added durability, much greater strength and better steering, the tubes also have aluminum hubs that pivot on a nylon and brass bushing. Not only are they functional, but they also look fantastic.

JPS Aluminum Axle Tubes

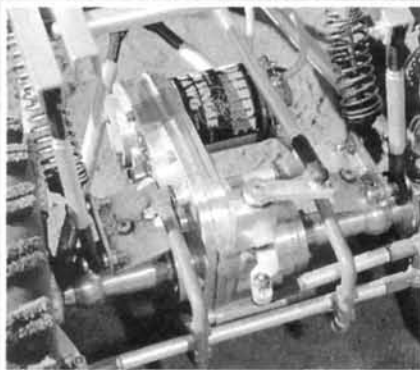


DAHM'S RACING BODIES Commando XL8



To top off my wild ride, I chose an equally wild body: Dahm's* Commando XL8. Designed to fit the new, popular ⅛-scale nitro trucks, this body happens to fit perfectly over the 13½-inch ESP chassis. I sent the body to my buddy Richard Muise at Motion Graphics* for a little dab of paint, and as you can see, he did a really killer job.

ff I used



JPS Aluminum Gearboxes

Initially designed for pullers, JPS's* durable 6061 T-6 aluminum gearboxes take stock or after-market gears. They have longer motor slots, and this allows you to use pinion gears that are larger or smaller than the stock ones. The nice thing

about these gearboxes is that you can transfer your stock gearbox innards over to them without any modification. JPS also offers steel gears for all those die-hard pullers. According to JPS, they've heard reports of trucks pulling more than 600 pounds while using their gearboxes!

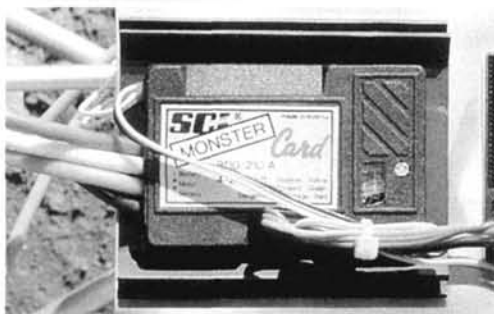
SCI

Monster Card

The SCI* Monster Card is my ESC of choice because it allows you to use anywhere from 4 to 20 cells, it has reverse with linear control at all speeds, it comes with built-in forward and reverse LEDs and a single potentiometer setup (neutral set point only), and it has a massive built-in heat sink. Pretty nice features, aren't they?

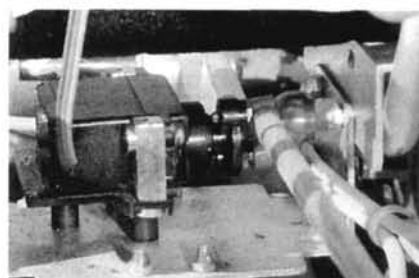
The Monster Card is specifically designed to work in large 4WD monster trucks. It has 16 FETs—eight for forward and eight for reverse—and because of that, it has the same characteristics in forward as it does in reverse. Most reversing speed controllers have 12 FETs—eight for forward and four for reverse.

Size-wise, the Monster Card is exactly that—a monster! It's almost 3 inches long and slightly more than 2½ inches wide. The unit is relatively easy to set up, and, during my testing session, I never encountered a problem with it.



JR REMOTE CONTROL

NER-4735 Servo



Choosing a steering servo is a very important task—especially with a truck this size! To steer my beast, I chose JR Remote Control's* NER-4735 servo. It has 90 oz.-in. of torque, its transit speed is .12 second per 60 degrees, it comes with dual ball bearings and it weighs only 1.72 ounces. Throughout the testing session, I never had a problem with it. It's a fast servo with enough torque to turn those huge tires at a very fair price. If you haven't seen all the advertising hype about it, let me fill you in. The folks at Horizon—distributors of the JR lineup—made a display in which the servo actually lifts a bowling ball off the ground. If this servo can do that, I think I can trust it in my truck. So, if you're looking for a new servo for your truck, check it out.



Have you ever side-swiped a sturdy object with your stock Clod Buster wheels? Well, I

don't know about you, but I've broken a few stock wheels by hitting trees, people, houses and so on. Anyway, when I had the project truck in mind, I knew that the stock wheels had to go. I replaced them with these stunning 6061 T-6 aluminum wheels from JPS. They're slightly heavier than the stock plastic rims, but I think that the extra weight gives the truck more stability over the rough; and besides, they look great! If you're really industrious, you can polish the wheels with aluminum polish for a mirror-like finish.

JPS Aluminum Wheels



TRINITY

Clod Buster Shocks

I needed something other than the stock shocks to support my truck over the rough stuff, so I decided to use a set of Trinity's* Clod Buster shocks. Because of the ESP chassis's design, you need only four shocks instead of the stock setup, which requires two at each wheel. The gold-anodized shocks come in pairs and are the perfect length for the chassis. I filled the shocks with Trinity's 50WT silicone oil, and I was ready to rumble.



THORP MFG.

Clod Buster Differentials

I replaced the stock Tamiya gear diffs with these cool ball diffs from Thorp Mfg.* The major benefit of using these ball diffs is better steering. Comprising 72 parts (yes, that's right, 72 different parts—mostly steel balls), the modular 1-pitch diff fits in stock and aftermarket gearboxes. The diff is completely adjustable and more reliable than the stock units. Adjusting the diff is as easy as holding the gear by the teeth and turning the knurled knob on its right side to loosen or tighten it.



PURE-TECH

EZ-Mount

Even though my battery pack was secured tightly in the chassis with tie-wraps, I wanted to prevent it from rubbing against the aluminum chassis. I used two of Pure-Tech's* EZ-Mount neoprene rubber battery/receiver protectors—one on each end of the pack—so that it wouldn't slide around at all. They worked so well that I decided to wrap one around my receiver as well. It's a good idea; it helps to protect your receiver from shock and debris. Besides, it looks cool!

PRO-LINE

Monster Truck Tires

Initially, I ran the original tires on my project truck, but with all the added horsepower, the stock tires just weren't cuttin' it. I attempted some pretty radical hill climbs and lost traction before reaching the top. That's when I started shopping around and looking for a better tread combination. Enter the Pro-Line* monster truck tires. What caught my attention were their burly tread patterns. The vee-type treads rip up loamy terrain and are good for general off-roading. They're a steal at only \$26.95 per pair. With these tires, I scoff at hills.



To complement my aluminum gearboxes, I snagged a set of JPS servo-savers. Designed to fit in either JPS or stock gearboxes, they work like the stock servo-savers. Although they're similar to the stock units, the JPS servo-savers are more adjustable. Their longer arms improve steering, and they have three holes for mounting the ball ends.

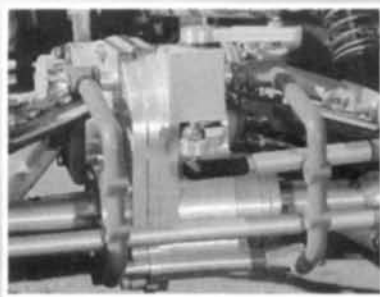
And here's a trucker tip for those of you who want to lock your steering: you can take out the spring and replace the long screw with the supplied short screw. I opted to keep the long screw and spring; I really didn't want to kill my servo, but I found that the steering was still pretty sloppy. The folks at JPS informed me that if I wanted tighter steering, I should back the screw out and then put it back in; repeating this several times would thread the bolt into the aluminum body of the servo-saver more, and this would increase the tension on the spring and tighten the steering. Got it? Good.

One more thing: your stock Tamiya ball ends won't work in this servo-saver. Tamiya uses metric bolts, but JPS uses American standard threads in everything they make. I ended up using Robinson Racing* titanium ball ends with RPM* ball cups.



JPS

Servo-saver





TRINITY

8-Cell 1700 SCRC Battery Pack and 6-Cell "D" Battery

Providing the juice for my truck is a monstrous, 8-cell Trinity 1700 N-SCRC Pro Pak battery. It's a great pack for ballistic speed, and it gives me pretty good run times—roughly 10 minutes. But when I want to get more run time, I go for the big boys—six sub-D cells. With these, you get massive amounts of run time. You won't quite get the speed that typical batteries provide, but the fun you'll get out of the extended run time will make up for it. The D-cell pack splits into two 3-cell packs, and they nestle snugly between the chassis brace in the front and the chassis brace in the rear of the frame.



TIME TO DRIVE

With the truck finally completed, it was time to do some testing. I set it on the ground, adjusted the trim on my KO Propo* EX10, pulled the trigger back, and the truck exploded! (No, I don't mean it blew up; it was fast!) It accelerated at an alarming rate. But I noticed that every time I took off from a stop, the diffs slipped a lot, so I had to take apart the cases and tighten them. After I had done that, the truck would pull the front wheels off the ground whenever I pegged the throttle. What a cool sight!

Piloting a truck like this requires an entirely new driving technique. When the truck is up to speed, the four-wheel steering becomes very responsive. If you're not

careful, you'll end up on your lid in a hurry. I flipped my truck about half a dozen times before I got the hang of its high-speed, quick-handling high jinks. The truck's top speed is 20 to 25mph, and it gets a little twitchy at those speeds. This truck feels at home creepin' and crawlin' over brutal obstacle courses. My test session involved concrete curbs, massive leaf piles and fallen telephone poles, and the truck handled each with ease.

This truck is a blast to drive! If you're looking at getting into monster trucks, I hope that this article has given you a few ideas. Look for more Project Big Trucks soon...

I'd like to especially thank Eric Sutcliff of ESP for all his setup help and my buddy John Huber for helping me tie up all the odds and ends.

TRINITY Sapphire Modified Motors

I wanted to get some horsepower in this big beast, so when it came time to decide which motors to run, I opted for a set of Trinity modified motors—specifically, two of their Speed Gems machine-wound Sapphire modifieds. The Sapphire is a great motor for those of you who want high performance without paying high-dollar figures. This 45,000rpm, 17-turn, single-wind motor produces a lot of torque, and this helps turn those big tires. It comes with 4.95 wet magnets and dual ball bearings.

During my first testing session, I was amazed at how fast the truck was. I was running the vehicle at a local schoolyard, and I found a telephone pole lying on its side. I crept up to the pole and then nailed the throttle. The truck acted like a mini chain saw; the tires ripped up the pole as if it were nothing. The truck launched over it with no problem. I was impressed! The motors are completely ballistic in this truck!



The author with the finished machine—Project Big Truck. Look for Project Big Truck, Part II, coming soon to a theater near you!

**Here are the addresses of the companies mentioned in this article:*

Tamiya America Inc., 2 Orion, Aliso Viejo, CA 92656; (714) 362-2240.

ESP Mfg., 20 Crystal Lake Plaza, Crystal Lake, IL 60014; (815) 455-5440.

JPS Custom Wheels, P.O. Box 3014, Fullerton, CA 92631.

JR Remote Control; distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-0022.

Robinson Racing Products, 4968 Meadowview Ln., Mariposa, CA 95338; (209) 966-2465.

RPM, 14978 Sierra Bonita Ln., Chino, CA 91710; (714) 393-0366.

SCI Corp. of America, P.O. Box 13099, Sarasota, FL 34278.

Pro-Line USA, P.O. Box 456, Beaumont, CA 92223; (714) 849-9781.

Thorp Mfg., 4054 E. Mission Blvd., Pomona, CA 91766; (714) 622-6518.

Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ

07036; (908) 862-1705.

Dahm's Racing Bodies, P.O. Box 360, Cotati, CA 94931; (707) 792-1316.

Motion Graphics, 2645 Robert Arthur Rd., Westminster, MD 21157; (410) 848-0008.

Pure-Tech Racing Products, 1611-A S. Melrose Dr., Ste. 180, Vista, CA 92083; (800) 448-1898.

KO Propo, 25-10 Sendagi, 3-Chome, Bunko-KU, Tokyo, Japan.



Radio Control VS. BMX

by TONY DONALDSON

Who's faster?

WHAT WOULD happen if you ran an R/C car on a racetrack designed for full-size BMX bikes rather than $\frac{1}{10}$ -scale cars? How high and how fast would you be able to go on a track full of tall berms, long straightaways and insane single and double jumps?

We had to find this out firsthand. And, just to make it more interesting, we put Team Losi's super-fast R/C racer and R&D guy Jon Anderson up against Team Mongoose's top pro BMX racer Brian Schmith.

THE SCENE

We couldn't use just any track. It had to be a really rad one—the Sycamore BMX Track in Simi Valley, CA. This really challenging track has scads of great jumps, including tall doubles and one quadruple, and it has three sets of doubles (called the "six-pack") in one straight.

When we told Brian about the idea, the first thing out of his mouth was, "Can I run over the little car?" Good competition was brewing from the start. Jon was really intrigued with the idea. Before he got into R/C cars, he was a national-class BMX racer for Redline—one of the top teams in the sport. In 1986, he earned the title "Rookie of the Year."



THIS IS GONNA BE GOOD

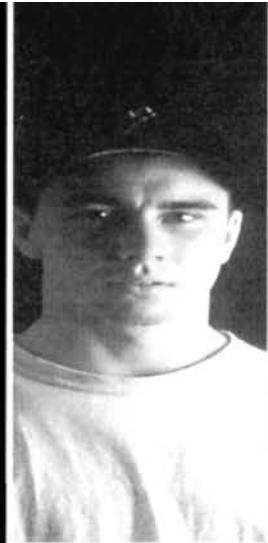
We obtain permission to use the track one morning before a regular race and converge at sunrise, loaded with bikes, R/C gear and cameras. Jon sets up his chargers and goes off to check out the track. He decides that the best vantage point for surveying the entire track is from the roof of the announcer's tower.

Brian comes out to the track to warm up just as Jon brings out his Losi Team Car. Brian has this look of relaxed confidence, thinking that there's no way that little car could keep up with a top factory pro. His jaw drops the first time the car takes off down the first straight.

Jon has the car flying over the jumps—big air and fast. He runs a couple of battery packs through to get used to the jumps and turns. The turns he wires instantly, but the jumps are another story. BMXers have to hit the jumps full speed to clear 'em; Jon has to hit the brakes all the way up a couple of the bigger jumps so that he won't loop out (flip backward in the air) and overshoot the landing jump.

Jon lands so far past the jumps that, on one landing, he cripples his car. The first casualty of the day is a rear A-arm and a wheel, broken during a huge jump that ended with a flat-bottom landing when the car landed sideways. Jon makes the repairs and decides that his car will be more stable.

A couple of runs later, and he's almost ready. Jon maneuvers the car super-smoothly through almost the entire track now. The toughest part is



NAME:

Brian Schmith

SPONSORS:

Mongoose, Bicycle Center, Velo, Sedis

EQUIPMENT

- Mongoose Aluminum Solution Pro frame
- Mongoose chromoly forks
- Mongoose 8-inch handlebars
- Mongoose grips, cranks, seatpost and clamp
- Mongoose tires
- DK XXL stem
- Tioga bear-trap headset
- Araya 7X rims
- TNT hubs
- Crupi pedals (with titanium spindles)
- Velo saddle (with titanium rails)
- Dia Compe 987 cantilever brakes
- Dia Compe MX88 levers
- Mountain-bike brake cables
- 45/16 gearing

RACING HISTORY

- 11 years racing BMX
- Went from A Pro to AA Pro in only three races
- Won Pro Class and Cruiser Class at 1991 ABA Grand Nationals
- 1993: national no. 7 in Pro Cruiser; no. 18 in AA Pro
- 30+ national wins
- 1987 California state champion

COMMENTS: A full-time college student, Brian holds BMX racing clinics around the country (when he's not racing or studying). He once took a short sabbatical from BMX because of a broken neck (jumping after a full day of racing).



NAME:

Jon Anderson

SPONSORS:

Team Losi, Trinity, Novak, Futaba, Jammin Products, Lunsford, The Ranch Pit Shop, Jon & Joonbugs Mfg.

EQUIPMENT

LOSI LX-T TRUCK

- Trinity 7-cell battery
- Trinity 13-turn motor
- Futaba radio/receiver
- Novak HPC speed controller
- Gearing: 21/88
- Lunsford turnbuckles
- Lunsford tie rods (titanium)

LOSI DOUBLE-X TEAM CAR

- Trinity 6-cell battery
- Trinity 11-turn motor
- Futaba radio/receiver
- Novak HPC speed controller
- Gearing: 21/84
- Lunsford turnbuckles
- Lunsford tie rods (titanium)

RACING HISTORY

- 7 years of R/C racing
- 5 years with Team Losi
- First place—1994 Reedy Race of Champions (2WD)
- Two national titles
- 13 top-10 finishes at national events
- 11 years racing BMX (7 years on Redline, 2 years on CW)
- Pro Rookie of the Year (1986)
- Two-time world champion (1979, 1985)
- 125+ national wins

COMMENTS: Jon races at national and local events for Team Losi. He also builds prototype parts and models, and he works on the R&D of hot new stuff.

that he's on top of the tower, and the tower is at one end of the track. The far end has two blind spots and is twice as far away as any R/C track's farthest point. At this point, Jon is having trouble controlling the car, and the car is launching way too high over one really big jump—so high, in fact, that even with Jon nailing the brakes up the face of the jump, the truck lands nose-up at the bottom of the landing. He has already cracked the Lexan body all the way across the pins.

Despite these extra challenges, Jon decides that he's ready for one quick practice start. Bike and truck are side by side. When the gate drops, Jon hits the throttle. His tires have so much bite on the perforated metal gate that the truck wheelies across it and almost flips backward, but it still shoots ahead of Brian.

THE RACE

To make it as fair as possible, there are three races, and the best two out of three wins takes it.

The bike and truck are again on the gate. The recorded announcement sounds. "Riders ready; watch the lights!" The lights go, and they're off! Both are firing down the track, right next to each other. They're neck and neck through the first turn and over a jump. The car catches so much air and is so close that it lands on Brian's right hand in midair! Brian and Jon are both so startled that both bike and truck end up off the track.

The first race is re-started. Same result: both are side by side through the first straight. Jon is trying to keep up the pace and, through the blind spot, he hits a tire on the inside of the turn. He has no reverse, and even with a minor amount of corner marshalling, he can't catch up to the bike.

The pressure is on. It's one to zip in favor of the bike. If Brian wins one more, he'll take the victory. If Jon wins, the



third round will decide it.

In the second round, Jon hangs back slightly and takes the second turn more carefully. The truck jumps into the second blind spot and, with Jon unable to see, he miscalculates the second turn and goes off the back side. He's back on seconds later, but he has lost too much momentum, and he can't regain enough lost time.

For round three, Jon just wants to make it around the whole track without crashing and still be near the bike. He makes it through the first and second turns without a problem, just behind the bike, but when he tries to catch Brian in the third straight, he loops it over the tall jump. He has fallen, and he can't get up.

THE WINNER IS...

The winner of the actual race we set up was Brian Schmith. His fastest lap time was 0:45:57. Jon's best time (with mishaps) was 0:54:54. If Jon had had more time with his truck on a BMX track, he could have smoked Brian. They were next to each other through the first straight, but only the truck would be able to keep that pace throughout the whole track.

Who had the most fun? That's hard to

say, but by the end of the challenge, Brian was pooped, and Jon wanted to keep going. He was having too much fun! Jon let Brian play around with his car for a while, and Brian had a blast! If we hadn't had to clear out so that the rest of the BMX racers could practice, we might have been there all day. As for the great air time, that was a tie, too. Brian is a great jumper, but the car and the truck had some major hang time.

If you're interested in running your car on a BMX track, the first thing you have to do is find one. Check with your local bike shop, or contact one of the BMX sanctioning bodies listed at the end of this article. Once you've found a

track, talk to the track director about running your car(s) on the track. You might have to become a member of the ABA or NBL to be covered by the track's insurance. Sycamore BMX allows ABA members to run on the track when the track is open and no practices or races have been scheduled. Director Wayne Joynt says that if there's enough interest, the track could insure R/C'ers.

And for anyone who's afraid that the cars might damage their well-groomed track, Brian was watching the car and commented that it actually *improved* the track's surface.

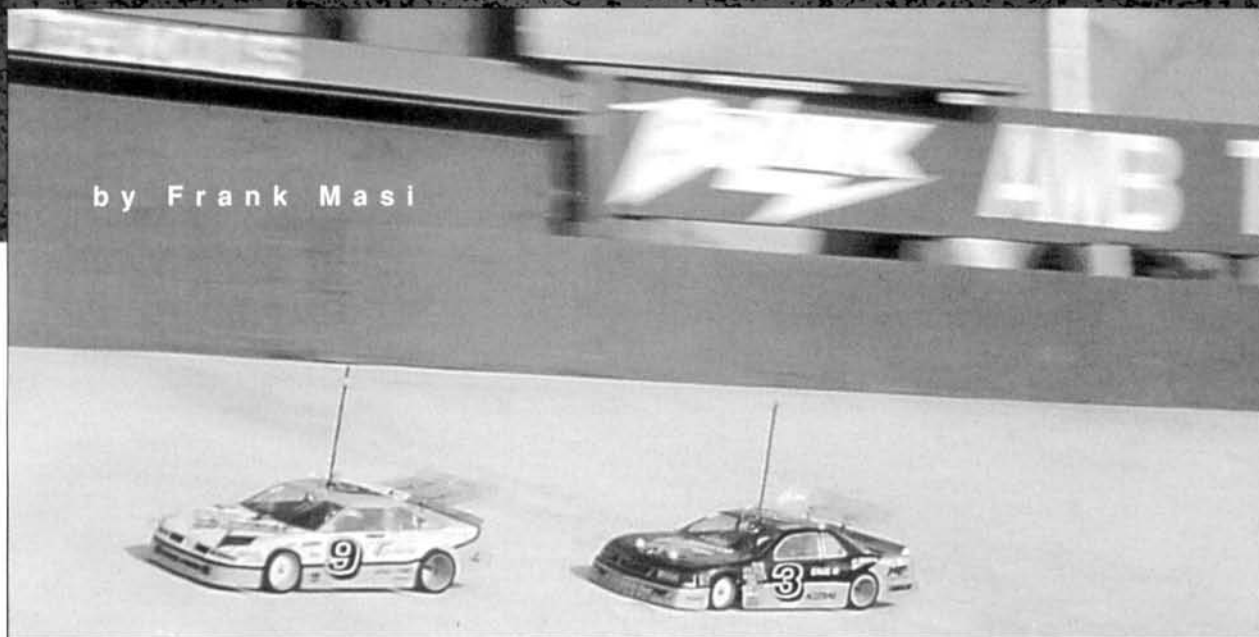
Just be prepared to break and repair parts. R/C casualties included three rear A-arms; one top shaft; two rear wheels; one loose battery connection and a rear chassis section that was ripped off when the truck hit a sprinkler head-on at full speed! Good luck finding a BMX track. You're going to have tons of fun.

**Here are the addresses that are pertinent to this article:*
National Bicycle League, 3958 Brown Park Dr., Hilliard, OH 43026; (614) 777-1625.
American Bicycle Association, P.O. Box 718, Chandler, AZ 85244; (602) 961-1903. ■

OVAL RACINGBASICS

**Speedway
Secrets**

by Frank Masi



STOCK-CAR racing is, by far, the most popular form of motor sport in the United States, and I'm sure that the reason radio-control super-speedway racing has caught on so well is because the cars closely resemble full-size NASCAR stockers. Although the uninitiated may believe this form of oval racing to be easy, there are a lot of factors that deter-

mine a car's performance—factors that can give you the edge over your competition.

We've compiled the information in this "Super-speedway Secrets" feature based on conversations with the R/C industry's leading sources—the top racers and the people who make the products. We hope that all of your oval-racing questions will be answered.



Aerodynamics plays a major role in a car's handling, especially at high speeds. Not all bodies have the same aerodynamics; some may work on a particular type of track, some may not. According to Rick Jordan, you want a body

that has more of a blunt appearance and less slope to its nose when running on high-speed tracks. The faster the car travels, the more downforce is placed on the front wheels by the body. To compensate for this, you might have to add a larger wing to the rear of the car; this would increase drag and slow the car. The lower the downforce created by the front of the body, the better the car will handle at higher speeds.

For shorter or slower tracks, Jordan recommends a body with a sharper sloped nose for more downforce on the car's front wheels, which will help the car steer through the turns and minimize push.

Most serious oval racers carry several

types of body with them. Members of Jordan's Bolink race team use the company's T-Bird body on long tracks, a Lumina body on medium tracks and a Pontiac on short tracks.

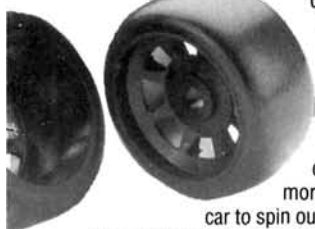
Body mounts are also important. To minimize drag, they should protrude from the body just enough so that a body clip can be attached. Also, don't make your wheel cutouts much larger than the tires. Wheel openings that are too large can "scoop" a lot of air from behind the tire and slow the car. To prevent the hood area from becoming distorted at higher speeds, some racers even add another body support to the front of their cars.

AERODYNAMICS

Tim Morton ON TIRE STAGGER

Tire stagger—a technique used in full-size racing—occurs when the inside wheels have tires with smaller diameters than those used on the outside wheels. The theory behind stagger is that it's similar to what happens to a Styrofoam cup that's rolled on a flat surface: it turns in the direction of the smaller bottom. According to TRC's Morton, more stagger, i.e., a greater difference in size between the inner and outer tires, will make the car turn more easily and require less input from the driver. On the downside, running more stagger tends to cause the car to spin out more easily.

Stagger is often used to fix a car that pushes. This is especially true when racers lock up their diffs to prevent slipping. Primarily, only capped, radial tires are staggered. Foam tires can be staggered, but they quickly wear at an uneven rate—especially the outside front tire.

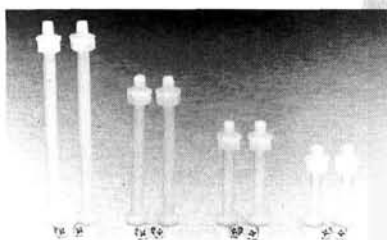


According to Dale Epp of Protoform, you should check the condition of the body posts before you mount a new body for oval racing. Posts can become "tweaked" or even soft, and that could allow the body to lean under the cornering forces of high-banked oval tracks. Posts are cheap, and it's a good idea to change them periodically. If you use several types of body, keep a set of body posts for each. This will save time when you change body styles, and because you've already set each post, the mounting job will be perfect.

Wolfe Motorsports makes lightweight magnesium body-post adapters that are designed to thread over the tops of most body posts. With these adapters, fine height adjustments can be made easily, and the body is held to the posts with 4-40 capscrews, giving clean aerodynam-

ics and an uncluttered appearance to the body.

"When running with capped tires and 'black' batteries, most racecars tend to be a little overweight," says Epp. To compensate for this, racers rely on bodies made of a thin, light material. Lightweight bodies have their drawbacks; they're more eas-



BODY MOUNTING TIPS

ily distorted by aerodynamic forces, and they're more susceptible to crash damage. To add strength, cut out parts of your old car bodies (use the same style and brand as that of the new body), and "Shoe Goo" them to the inside of the new body. The sides and hood are prime candidates for this treatment.

If you own a high-end radio, i.e., one that has more adjustments and trim settings than a standard, beginners' radio, you can use its many features to make driving your oval car easier. When adjusting his transmitter for oval track racing, Team Trinity's Joel Johnson—one of the world's best on-road and oval drivers—sets his steering exponential so that it's linear, or totally proportionate to the transmitter's wheel movement. He also sets the transmitter's steering throw so that his car's tires will turn from lock to lock; but he lowers the steering's dual-rate adjustment so that it takes nearly 90 percent of steering-wheel travel just to turn the car's wheels a little.

Joel sets left/right turning bias at equal amounts, even when he races on a left-turn-only track. "I do this because when you get



JOEL JOHNSON ON RADIO SETUP

into an emergency or traffic situation, you're less likely to make a mistake if you have equal steering in both directions," he explains.

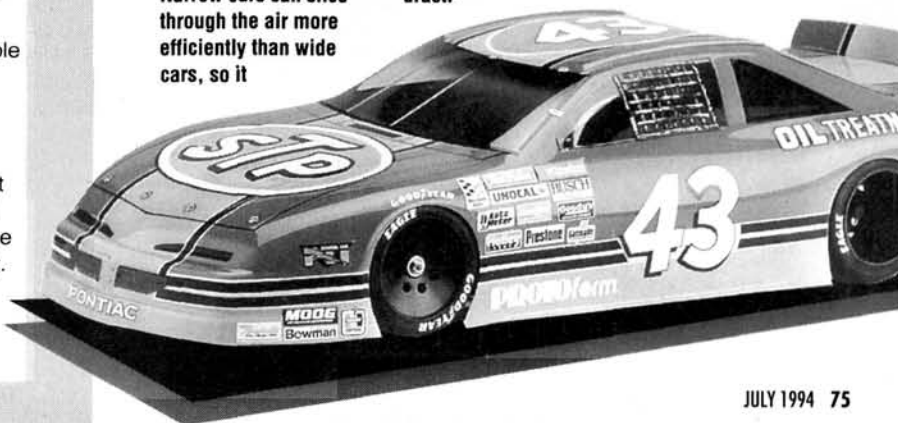
"Don't use exponential to change steering sensitivity. Your car should work with linear steering; if it doesn't, make it so. On most tracks, you shouldn't need more than 15 to 20 degrees of wheel steering," says Joel.

NARROW VS. WIDE

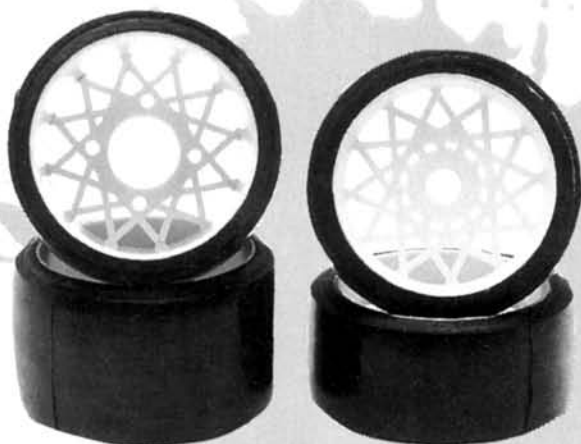
Rick Jordan of Bolink believes that although narrow cars don't handle as well as wide cars, they're capable of achieving higher speeds, owing to their smaller frontal areas. Narrow cars can slice through the air more efficiently than wide cars, so it

takes less power to move them at speeds comparable to those of a wider car. Jordan also claims that it's harder to set up a narrow car because its narrow wheel track drasti-

cally changes its roll rate and weight transfer. As a rule, narrow cars work best on long, wide tracks, and wide cars are better suited to short, tight tracks.



OVAL RACING BASICS



CAPPED TIRES

The capped tires that are so popular on concrete oval tracks were actually derived from 1/4-scale tires. According to TRC's Tim Morton, capped tires were first tried on 1/10-scale cars in '88 at Lake Whippoorwill Speedway, and they were actually slower than foam tires. Wait a minute! If they're slower, why does everyone now run them? Morton explains that the tires' makeup is the same today as it was in '88, but their aspect ratio (rim

size in relation to foam size) and the size and shape of the rim are very different, and this is the key to capped-tire performance.

The biggest advantage of capped tires over other types is their very low rolling resistance, which enables the car to travel at higher speeds. Why don't you see roadcourse racers using capped tires? With road-course racing, the corners are tighter and the car is constantly accelerating and braking with

great force; the extra adhesion and increased rolling resistance of foam tires are needed to maintain traction. Morton says, however, that TRC would like to develop a capped tire that would work on roadcourses.

Two types of material are used to make capped tires: conventional foam and a new, lighter, high-density material. On high-traction tracks, these new tires free the car to go faster (less rolling resistance), but they provide less traction, and they're more susceptible to crash damage. As a rule, you should use the older-style radial tires on shorter tracks that have less traction. On long tracks with higher traction, try the new ones. Also, concrete tracks will usually provide more traction than asphalt ones, because asphalt contains oils that surface as the track heats up.

Morton also emphasizes the importance of capped tires' seams for performance. If halves of the mold that makes the cap don't line up exactly, the tire will make the car "squirm" and wander on the track.

FRONT SUSPENSION— CASTER AND CAMBER

—We talk with Jim Dieter

A car's steering kingpin is the upright post around which the steering arm pivots. The terms caster and camber refer to the position of the kingpin in relation to the ground. How the kingpin is positioned affects the attitude of the steering block and its front wheel axle. "Caster" describes the inclination of the kingpin in a forward or backward direction, or the angle of the kingpin when viewing the car from the side. Camber is

the inclination of the kingpin toward or away from the car's center.

Both adjustments are critical, and in superspeedway racing, they're closely linked. "On an oval car, you can't alter camber without considering its effect on caster, and vice versa," says Jim Dieter, Trinity's chief car designer. "The main purpose of these settings on oval cars is to ensure even tire wear. If your tires wear in only one spot, you need to adjust the car's camber, and perhaps

its caster angle, so that they wear evenly." If your tires wear evenly, you have maximum tire traction, and your tires will last longer. Generally, if you decrease caster, increase negative camber to compensate for it and keep the tire wearing evenly.

How can caster and camber settings be used to adjust handling? "Increasing the car's caster angle will make it more stable at high speeds," says Dieter. If your car "pushes" (understeers), decrease caster and camber to help correct it. Conversely,

increasing caster and camber will cure oversteering and make the car handle in a more "forgiving" way.

A few of the more advanced car designs feature suspension with "active" caster, which changes angle as the suspension operates. This type of suspension allows the car to "rotate" faster through the turns, but according to Dieter, you don't want this when you run on large, concrete ovals. Use active caster when running on tight oval courses, but not on large ones.

SPOILERS



"Never run your car without a rear spoiler," proclaims Dale Epp. "Don't believe the myth that a 'wing-only' setup will be faster, or that the car will be faster without a drag-inducing spoiler. This simply isn't true." Though Epp firmly believes that a spoiler is a must, he does concede that there may be an odd track where you don't need one, but these tracks are few and far between.

It's important to run the smallest possible spoiler. The best way to determine how big it should be is to run a few tests on the track. Have three or four spoilers of different sizes. For the tests, use trophy tape to fasten them to the car; it will hold the spoiler tightly, but you'll be able to remove it cleanly (unlike most servo tape). Start with the largest spoiler; run the car, and gradually decrease the size and/or the angle of the spoiler until you've reached a balance between stability and straightaway speed. For racing, fasten the spoiler to the car's rear edge with three small nylon nuts and bolts, and be sure to drill all your spoilers with the same bolt-hole pattern.



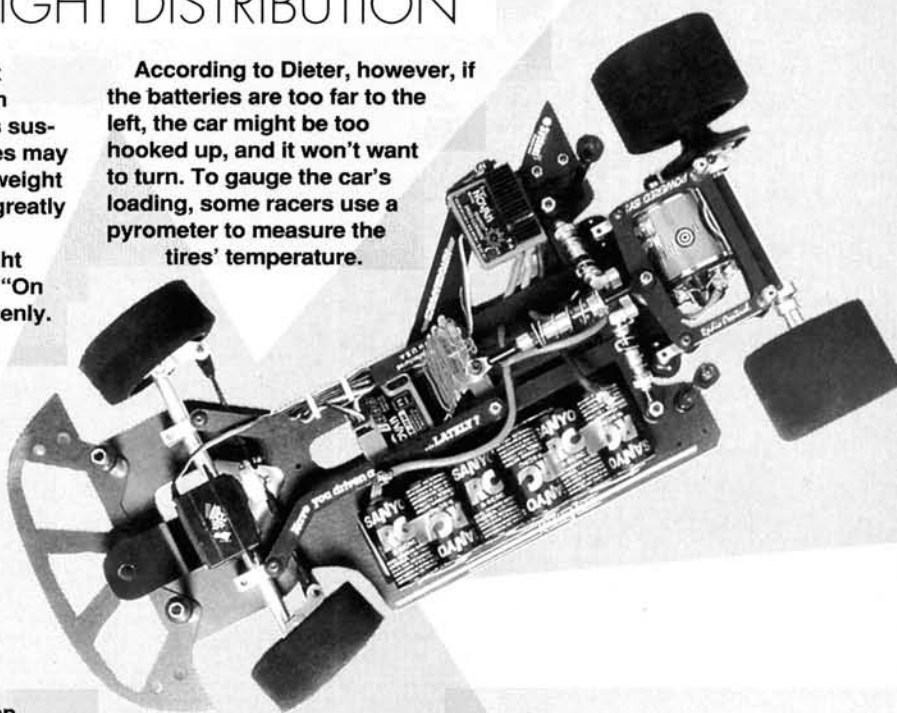
DIETER ON WEIGHT DISTRIBUTION

A car's weight is placed on its tires but not always in equal measures. Depending on where its components are placed and how its suspension is set, one or more of a car's four tires may carry more weight than the others. How this weight is placed is called weight distribution, and it greatly affects how a car handles.

According to Jim Dieter, an oval car's weight should be distributed evenly on all four tires. "On concrete tracks, you want each tire loaded evenly. You don't want one tire to take all the load because it will heat up, lose its traction and possibly come apart," says Dieter.

Because they only turn in one direction, oval cars must be "weighted" differently from roadcourse cars. For example, on a superspeedway track, an evenly loaded roadcourse car will burn off its outside tires. Why? Because on an oval track, almost all the cornering force is placed on the outside tires. For this reason, battery packs and other heavy components are placed to the left side of an oval car's chassis. Although much more of the car's weight is placed on its inside tires, things even out as it corners.

According to Dieter, however, if the batteries are too far to the left, the car might be too hooked up, and it won't want to turn. To gauge the car's loading, some racers use a pyrometer to measure the tires' temperature.

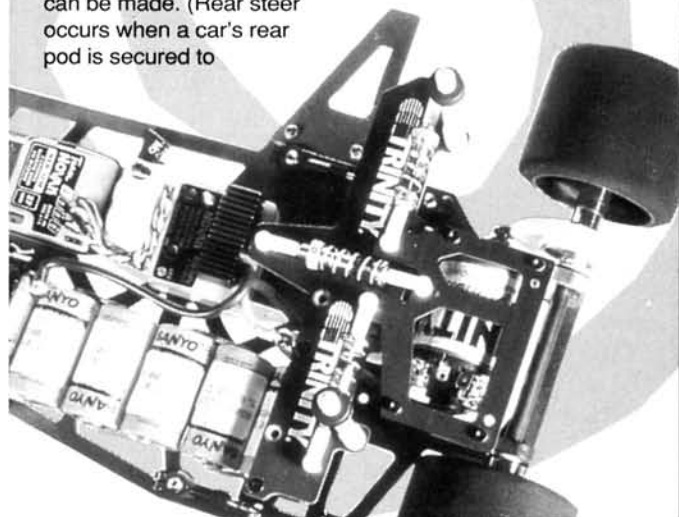


DIETER ON REAR SUSPENSION

Which type of suspension is better?—a T-bar type or a full-floating/shock setup? Jim Dieter says that with a T-plate suspension, a car will always be in the "ball-park," regardless of track conditions. However, with a full-floating rear end, many more adjustments can be made to dial in the car to the track. Roll center, roll stiffness and "rear steer" are a few of the adjustments that can be made. (Rear steer occurs when a car's rear pod is secured to

the chassis by two trailing links. If the links are of different lengths or are mounted at different heights, the pod will "cock" to one side as the chassis rolls while cornering. Dieter warns that rear steer should be used in small amounts, because even a little will drastically alter handling.)

Dieter sums it up: "On concrete, it's a matter of chasing the racetrack as its condition changes."



WINGS

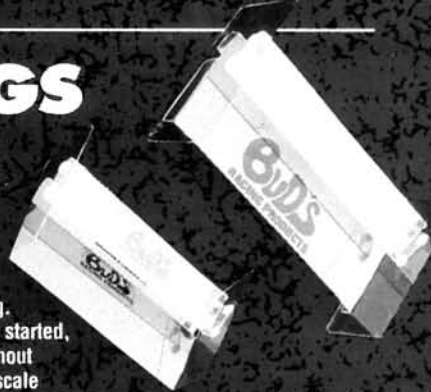
According to Bud Bartos, a top-level racer and the "King of Wings," you need some sort of wing for superspeedway racing. When superspeedway started, racers tried to run without wings for the sake of scale realism, but they quickly learned that at scale speeds of more than 500mph, the additional downforce that's provided by a wing is vital. Wings also provide stability. As technology improves and cars go even faster, wings are needed to keep them stable.

Believe it or not, faster cars require smaller wings. As speed increases, aerodynamic forces also increase, so less wing area is needed to provide the necessary downforce. Bartos says that airfoil-type wings create too much drag, whereas flat wings provide adequate downforce and stability without creating too much drag. For additional downforce, some racers use

venturi, or bi-level, wings.

When you mount a wing, keep the top about level with the roof of the car and the bottom level with the ground. The wing's leading edge should begin about 1/4 inch behind the car's rear axle. Changing this position will alter the way in which the wing's leverage is applied to the chassis.

Side dams are also important to a wing's performance. Wings with large side dams that are used on tracks with plenty of traction will provide added stability. Large side dams also work well on carpet tracks, especially if they're flat ovals.



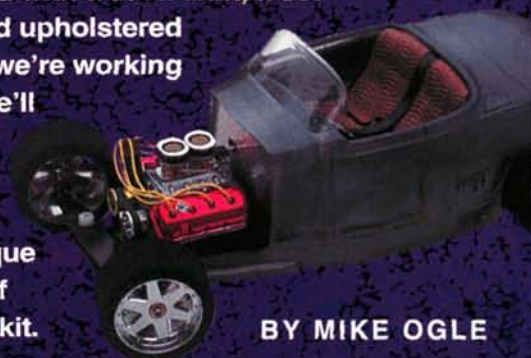
PROJECT '29

Part 2

Detailing the Engine

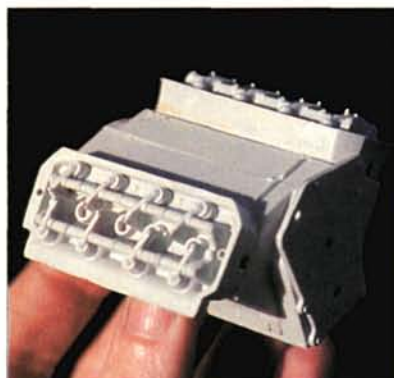
Last time, we started working on "Project '29"—a hot rod based on Parma's* ultra-cool '29 Ford Roadster kit. In the first installment, our car's interior was fitted with a stick shift, a set of detailed gauges and upholstered cloth seats. Because we're working from the inside out, we'll get around to the bodywork later. This month, we'll outfit Project '29 with a unique "pro-street" version of Parma's Hemi engine kit.

BY MIKE OGLE

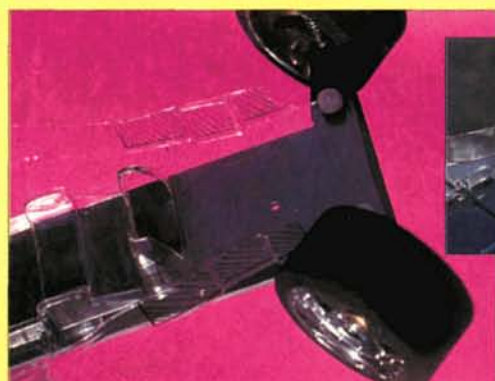


Basic Engine Assembly

1 Start by assembling the Hemi's engine block and heads as described in steps 1 and 2 in the instructions, but leave off the intake manifold (which we're going to modify) and the lower, chrome, oil pan. Paint the block assembly to match the car's body color, or paint it a metallic color to simulate an unpainted aluminum or steel block. I used a 50/50 combi-



nation of Testor's Model Master silver and black paint for plastic model kits.



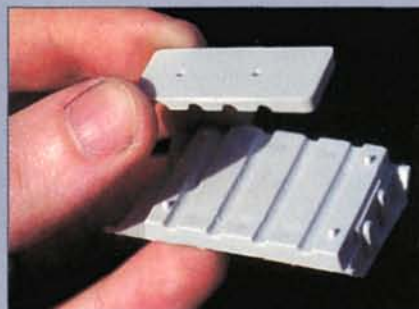
Make way for the Big Block

raised "hump" that's molded in to help position the battery pack. The motor's block will snuggle right up against the back part of this hump and fit perfectly in the chassis.

2 To make room for the Hemi, we'll first have to modify the Roadster's Lexan chassis plate a little. After you've cut out the chassis as indicated in the instructions, trim the side rails as shown in the photo, and trim away the front of the



Suckin' Wind



3 The intake manifold is designed to fit a large, competition-style supercharger, but I thought a roadster should have a more "streetable" engine, so I adapted the manifold for a dual-carburetor setup. Start by gluing the fuel-line upper box (part no. 54) directly on top of the manifold (part no. 11). This will be the carburetor's base. Then, using modeler's body putty, fill

and blend the two pieces together as shown, so it looks like a single, cast-aluminum piece. Using fine sandpaper, carefully shape the individual fuel "tunnels," and round everything off smoothly. When you're satisfied with the shape, paint it a flat-aluminum color.



Cheap Air Cleaners!

4 For a nifty-looking set of small, low-restriction air cleaners, glue a pair of

round piece of fine-mesh screen (available in the plumbing section of a hardware store), and glue it



Associated's* RC10L/12L rear-axle ride-height adapters (no. 4348, no offset) together back-to-back as shown. Cut out a little

into the bearing hole. Finish the air cleaners with a little silver paint or chrome MonoKote*. You can even paint them to match the

car's body color. The dual carburetors (part no. 114) are included in the Hemi kit, but they aren't pictured in the instructions. Scrape the chrome plating off the bottom of the carbs, and glue them directly on top of the manifold. In fact, anytime you glue on a chrome-plated part, be sure to scrape off the plating first; otherwise glue won't stick properly.



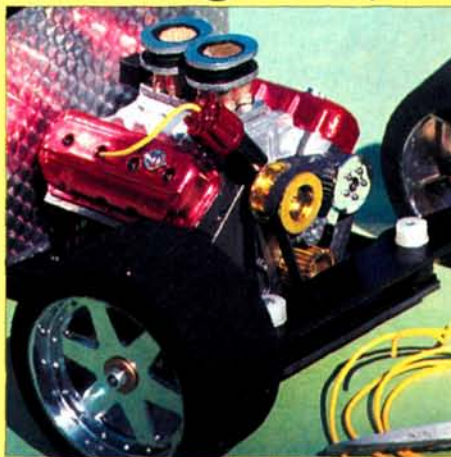
Engine Compartment

6 Of course, because we're going to open up the bodywork to display the engine, we'll have to make a firewall out of scrap Lexan to separate the engine compartment from the interior. Use the provided template to cut out your firewall, and paint it to match the bodywork, or cover it in a chrome or gold MonoKote*. I used an iridescent laser tape to simulate an "engine-turned" metal firewall.

8 I used Parma's Hemi wiring kit, which includes a rubber drive belt, simulated braided-silver fuel lines and yellow "Accel"-type spark-plug wire. The instructions about where to position the ignition wires are very good, so I won't go into that here. One little tip—in a full-size car, these silicone-insulated wires are very flexible; they sort of drape around the engine. If you

just run a big loop from the distributor to the plugs, it won't look right. The braided fuel lines are very stiff, and they don't droop much at all. The little Roadster is really starting to take shape now! Next month, we'll turn our attention to the running gear and the electrics. Stay tuned for the next installment of "Project '29."

Wiring It Up!



Add A Little Color

5 The Hemi's large chrome valve covers look great, but I decided to airbrush them with a few light coats of Pactra's Candy Red, tinting them to simulate a red-anodized finish. I used a fine-point blue Sharpie to tint some of the throttle-linkage components and the valve-cover breather caps. Two of the pulleys on the front of the engine

are tinted gold; you can do this by airbrushing them with Candy Yellow or by coloring them with a yellow Sharpie permanent marker. The rubber belt that runs around them will have to be shortened, because it no longer has to reach all the way up to the supercharger pulley. I spliced it underneath the lower pulley where it wouldn't show.



Exhausted

7 The "zoomie"-style headers included in the Hemi kit aren't exactly compatible with our street-style setup, so I trimmed the pipes to exit almost straight down out of the engine and behind the side-rail bodywork. Later, we'll install the tailpipes out the rear of the car. I painted the headers flat black, but high-temperature paint comes in a lot of colors, so paint your pipes any color you choose.

*Here are the addresses of the companies mentioned in this article:

Parma Intl. Inc., 13927 Progress Pkwy, North Royalton, OH 44133.

Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9337.

MonoKote, distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826; (217) 398-3630.



RACER NEWS

Presented by PROCAR and *Radio Control Car Action*,
and sponsored by OFNA, Kyosho and Mugen



PHOTOS BY A.R. FLATBUSH

1994 PROCAR WEST COAST GAS CHALLENGE

by A.R. FLATBUSH



Haulin' in Hemet



LAST YEAR'S inaugural West Coast Gas Challenge was a huge success—so much so that the event returned to Hemet, CA, for the first stop of the 1994 Gas Challenge series. Not only was Valley R/C Race Park expanded to provide better racing for the big, 1/8-scale buggies and trucks, but the program was also expanded to include the hot, new, 1/10-scale stadium trucks!

Sponsorship and attendance were also larger this year. *R/C Car Action* presented the West Coast Gas Challenge, which was sponsored by Kyosho, OFNA and Mugen and promoted by PROCAR. All of these manufacturers were there in force, as were Team Losi, Associated, MIP, Traxxas, Schumacher, Crono and Flying Point. Top drivers came from all over the USA, Japan, Taiwan, France, England and Sweden to see who would be the fastest around the redesigned Hemet course. Associated and Kyosho both introduced new 1/10-scale trucks to the gas racing world. The new Kyosho Outlaw Rampage Pro and the Associated RC10GT made the A-Main, but both were upstaged at the finish.



A cool place to race

Valley R/C Race Park may see 110+ degree days in the summer, but it's always a cool place to race. It's cool even when it's hot, because it's a city-run operation. The park, which is on school grounds, has a 99-year, \$1 lease, and the directors are all volunteers. John and Chris Schmitz, John Ruiz, Gerry and Bill Koller and Marty Schlosser volunteer their time so that local kids have a place to practice and race. Gas and electric off-road races are held most Saturdays, with open practice on Sundays and Mondays. Is it cool to find people who love the sport more than money, or what? For more information, contact: Valley R/C Race Park, 27224 Orangemont Way, Hemet, CA 92544; (909) 766-4944 (evenings).

QUAKING QUALIFIERS

After a full day of practice and setup on Friday, drivers had four chances to qualify for the A-Main. Saturday's schedule included three qualifiers for each class. The 1/10-scale trucks ran 5-minute qualifiers, while the 1/8-scale buggies and trucks ran 7-minute heats. If Saturday was unkind, each driver had a chance on Sunday morning to bump someone out of the A-Main. Competition was blistering, as drivers tried to uphold corporate pride or establish a pecking order among the many teams present.

• 1/10-scale 2WD truck. Brian Kinwald was the defending class champion, but he had switched camps this year from Team Associated to Team Losi. Associated picked up the slack, though, with Scott Hughes, who drove the new RC10GT to a TQ of 11/5:08.32. Close behind, Kyosho's Chris Walrod put the new Outlaw Rampage Pro into a solid second. Kinwald put his A-Main/Losi into third, just ahead of B.J. Christensen, who was piloting a Traxxas/MIP. Looking at the lineup for the 1/10-truck A-Main, it was crystal-clear that competition was fierce. Three Losi conversions, two RC10GTs, two Rampage

Trick pit bits



OFNA introduced the HODR Blazer SST at Hemet and sent two of them to the A-Main. With the exception of a center diff, the kit includes all of the HODR standard features. The direct-drive SST comes with multi-spoke wheels and low-profile, V-tread knobbies.



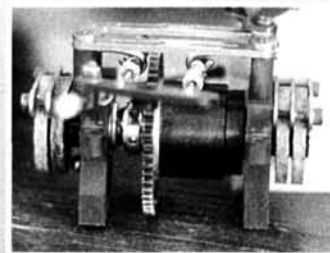
The all-new O.S. CZ12Z made it over just in time to power four drivers into the 1/10-scale A-Main. It comes with a heat-sink head, more radical porting and more power than the CZR (.61hp vs. .43).



Dynamite debuted its .12 motor—the TNT. This chrome-bore ABC motor features a heat-sink head and a sealed front bearing, and it's available with or without a pull-starter. The TNT was TQ at Hemet!



Eustace Moore shows off his winning A-Main driver, B.J. Christensen, and his Traxxas/MIP truck. Moore chose the Traxxas last year as a rolling test bed for his pigtail header, compact pipe and many other MIP prototypes.



Kyosho's Yuichi Kanai knows brakes. If two disks are better than one, then four must be better still. Kanai sandwiched two disks between three caliper plates on each side of his center diff.

WEST COAST GAS CHALLENGE

Pros, two MIPs and a prototype Schumacher made the A.

• **1/8-scale 4WD stadium truck.** This hot new class had no defending champ, but Mike Dunn established himself as the man to beat at Hemet. The Kyosho Inferno ST pilot was turning incredible laps and set a TQ that boasted a faster average speed than the 1/10-scale truck TQ (12.9mph to Hughes' 12.7)! So much for the tire limitations (stock ST wheels and block-tread tires) interfering with lap times! Dunn was also one of the only drivers to clear the infield triples. He was definitely red-hot, and his 16/7:21.98 TQ time would have put him in the buggy A-Main!

OFNA introduced the stadium-truck version of the HODR at the Gas Challenge, with Valley R/C



Team Losi's Brian Kinwald chases down MIP's Eustace Moore with his A-Main LX-T conversion. In the Main, Kinwald finished second behind MIP's B.J. Christensen.

Race Park's Marty Schlosser and OFNA's Louis Fernandez qualifying fifth and sixth. The Blazer SST had to use Mugen tires and wheels, though, as PROCAR deemed the aggressive Blazer tires illegal. OFNA had an ace in the hole, too, in the form of Jay Halsey. Jammin' Jay slid Mugen tires

Pavidis led qualifying with 17/7:09.37, and he also led five other Mugen Athlete pilots into the A-Main—amazing! A month before the event, the Mugen camp was searching for a working setup, and they obviously found it! There was only room for two Pirates, a HODR and a

lone Kyosho Inferno in the A.

A-Main action (from left to right in order of qualifying): top-qualifier Mark Pavidis, Cliff Lett, Jay Halsey, Derek Furutani, Brian Kinwald, Chris McElroy, Steve Chamberlain, Greg Hodapp, Doug Von Mosch and Chris Walrod.



THE SECOND, ANNUAL A-MAINS

• **1/10-scale 2WD truck.** TQ Hughes was dead last off the start after a melee in the first turn, but he worked up to the

WEST COAST GAS OFF-ROAD CHAMPIONSHIPS

1/10-SCALE 2WD TRUCK A-MAIN

Fin.	Qual.	Name	Chassis	Engine	Pipe	Fuel	Radio	Tires
1	4	B.J. Christensen	MIP Traxxas	MIP CZR	MIP	O'Donnell	Airtronics	Pro-Line
2	3	Brian Kinwald	A-Main/Losi	CZ12Z	Paris	Garry's Super	Airtronics	Losi
3	1	Scott Hughes	Associated	Dynamite	RC10GT	Blue Thunder	Futaba	Losi
4	6	Mike Bills	LXT Earl	CZ12Z	MIP	O'Donnell	Airtronics	Losi
5	8	Allen Losi	Earl/A-Main LXT	CZ12Z	Paris	O'Donnell	Airtronics	Losi
6	7	Austin Dvorak	Associated	CZR	O.S.	O'Donnell	Airtronics	Pro-Line
7	5	Eustace Moore	MIP Traxxas	MIP CZR	MIP	O'Donnell	Airtronics	Pro-Line
8	2	Chris Walrod	Kyosho	CZ12Z	O.S.	O'Donnell	Airtronics	Losi
9	10	Kris Moore	Kyosho	CZR	Paris	O'Donnell	KO Propo	Losi
10	9	Jamie Booth	Schumacher	OFNA RMS	Paris	O'Donnell	Futaba	Losi

1/8-SCALE 4WD BUGGY A-MAIN

Fin.	Qual.	Name	Chassis	Engine	Pipe	Fuel	Radio	Tires
1	1	Mark Pavidis	Mugen	Rex 3-port	Mugen	Mu-Juice	Airtronics	Pro-Line
2	2	Cliff Lett	Mugen	Rex 3-port	Mugen	Blue Thunder	Airtronics	Kyosho
3	5	Brian Kinwald	Mugen	Rex 7-port	Mugen	Mu-Juice	Airtronics	Kyosho
4	10	Chris Walrod	Kyosho	RXB	O.S.	O'Donnell	Airtronics	Kyosho
5	6	Chris McElroy	Pirate	Paris Picco	Paris	Blue Thunder	Airtronics	Kyosho
6	4	Derek Furutani	Mugen	Rex	Mugen	Mu-Juice	KO Propo	Kyosho
7	8	Greg Hodapp	Mugen	Rex 7-port	Mugen	Mu-Juice	JR Remote	Kyosho
8	9	Doug Von Mosch	Mugen	Rex 7-port	Mugen	Garry Juice	JR Remote	Mugen
9	7	Steve Chamberlain	HODR	Paris Picco	Paris	Byron	Airtronics	OFNA
10	3	Jay Halsey	Pirate	Paris Picco	Paris	Blue Thunder	Airtronics	OFNA

1/8-SCALE 4WD STADIUM TRUCK A-MAIN

Fin.	Qual.	Name	Chassis	Engine	Pipe	Fuel	Radio	Tires
1	2	Jay Halsey	Pirate RS	Paris Picco	Paris	Blue Thunder	Airtronics	Kyosho
2	9	Larry Plank	Mugen	Rex	Mugen	Mu-Juice	Airtronics	Mugen
3	4	Yuichi Kanai	Kyosho	O.S. RXB	Kyosho	K&B Special	Sanwa	Kyosho
4	3	Scott Parkes	Kyosho	O.S. RXB	Kyosho	Byron	Futaba	Kyosho
5	8	Tim Long	Kyosho	Paris Picco	Paris	O'Donnell	Airtronics	Kyosho
6	5	Marty Schlosser	Blazer SST	Paris Picco	Paris	Byron	Airtronics	Mugen
7	1	Mike Dunn	Kyosho	O.S. RXB	Kyosho	O'Donnell	KO Propo	Kyosho
8	10	Gary Kyes	Kyosho	Paris Picco	Paris	O'Donnell	Airtronics	Kyosho
9	6	Louis Fernandez	Blazer SST	Force	OFNA	Byron	Airtronics	Mugen
10	7	Derek Furutani	Mugen	Rex	Mugen	Mu-Juice	Airtronics	Mugen



Hey, come to think of it, doesn't Cliff Lett look a little bit like Robin Williams? Anyway, Cliff showed up at the Hemet race with his totally tricked-out Mugen Athlete, which featured a graphite radio tray and braces instead of the stock aluminum pieces.

front by the first round of pit stops. Eustace Moore led early, but he made way for B.J. Christensen. Hughes and Christensen battled back and forth up front, with Kinwald a tick back and ready to pounce. The rough track and the traffic took its toll during the 20-minute race, with Hughes having the most misfortune. Christensen took the win with 42/20:27.72, while Kinwald was caught at the buzzer with 41/20:01.63. Hughes finished third.

• **1/8-scale 4WD stadium truck.** TQ Dunn flamed out just before the start of the 20-minute A-Main and was half a lap behind after the first lap. Halsey took control from the start and was never challenged. Dunn was setting a blistering pace but had more misfortune. A competitor flipped into his path as Dunn ran wide open down the front straight, and the horrific crash broke an A-arm. Dunn went behind the wall for several laps, but he returned to please the crowd with his mega-air infield triples. Halsey won easily with 42/20:02.82.

• **1/8-scale 4WD buggy.** Hot from the 4WD truck win, Halsey jumped into the lead of the 30-minute buggy A-Main. He led the Mugen-filled field for 7 minutes, but suffered a flameout on his first pit. McElroy also flamed-out in the pits, dashing his hopes for a repeat victory. TQ'er Pavidis almost lapped the field on his way to the win with a 70/30:10.69, while teammates Lett and Kinwald completed a Mugen sweep of the top three positions. ■

QUICK!

Your car just died on the track. What do you do?



The old way: Run to track. Grab car. Run back to pit area. Attach glow plug starter. Plug in electric starter that's hooked up to 12V battery. Start engine. Run back to track with car.



The new improved KO way: Run to track. Plug new KO Propo EG Starter into car. Push button. Continue with race before your competitor is even out of the pit.

If you own the DuraTrax GT-10 or RC10T/LXT Conversion Kits, or Kyosho's Inferno 10 or Nitro Thrasher, starting your engine can be as easy as pushing a button.

KO Propo's new EG Starter System works like this: Bolt its on-board electric starter, featuring a compact gearbox and electric motor, onto the engine. Then just plug the system's hand-held starter unit into the connector harness and push the "start" button. It sends power to the glow plug and starter—and the engine starts instantly!



Before other racers are out of the pits, you'll slip the starter back on its handy belt clip and be back in action.

You can also use the EG Starter with scratch-built kits powered by an O.S. .10 FP or .12 CZ-R, or with Kyosho's Concept 10 helicopter.

And someday when you're showing off your trophies, you can tell your kids about the *old days*...before ni-starters and bulky electric starter boxes became a thing of the past.

KO PROPO

KONDO & CO., LTD.
Tokyo, Japan

The EG Starter System is not adaptable to the Kyosho Rampage series, the Kyosho 1/8 Ferrari F-1, the Kyosho Jet Stream, the Traxxas Nitro Hawk or the Kyosho Nitro Viper.



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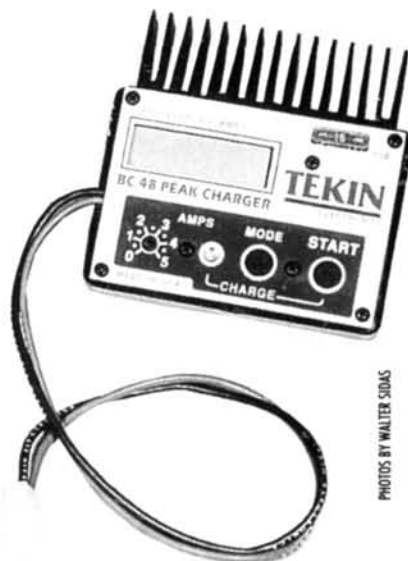
TEKIN'S

BC48

and

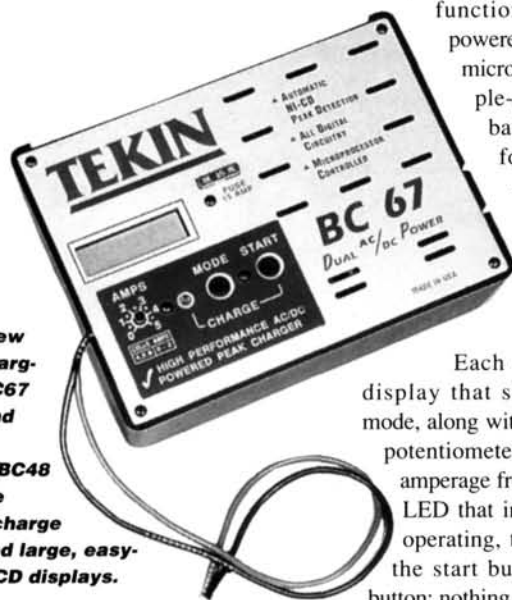
BC67

Chargers



PHOTOS BY WALTER SODAS

by FRANK MASI



Tekin's new AC/DC charger, the BC67 (right), and the DC-powered BC48 (top) have multiple charge modes and large, easy-to-read LCD displays.

IT'S A PROVEN FACT that how a battery is charged greatly affects its performance. A good peak-detecting charger can increase your battery's voltage and its run time. Tekin* has just introduced two new peak-chargers: the DC-powered, multi-function BC48 and the AC/DC-powered BC67. Both units feature microprocessor-controlled, multiple-charge modes to optimize battery performance. Except for the BC67's built-in 5A AC power supply, the features of both chargers are virtually identical.

CHARGE CONTROLS

Each charger has a large LCD display that shows the chosen charge mode, along with other information. A dial-potentiometer is used to set the charge amperage from 0 to 5. Besides the small LED that indicates that the charger is operating, the only other controls are the start button and the mode-select button; nothing could be simpler!

CHARGE MODES

The BC48 and 67 feature several charging modes. Depending on the selected mode, the charger's microprocessor will adjust the sensitivity of the peak-detection circuitry.

- **P.** This is the normal peak-charge setting that's used when the battery pack has some charge in it already, i.e., the pack isn't fully discharged.

- **P2.** This is the "second-peak" charging mode. Use this to top off your pack after it has been peak-charged in the first mode. A slight time delay at the end of the charge warms the cells to provide maximum voltage.
- **CS.** This is my favorite mode. I *hate* the false peaks that can occur when charging a completely discharged pack. Using this



The controls of both chargers are similar. The "Start" button begins the charge sequence, while the "Mode" button allows you to scroll through the various features. Charge amps can be set using the dial shown at left.

Reach the Peak!

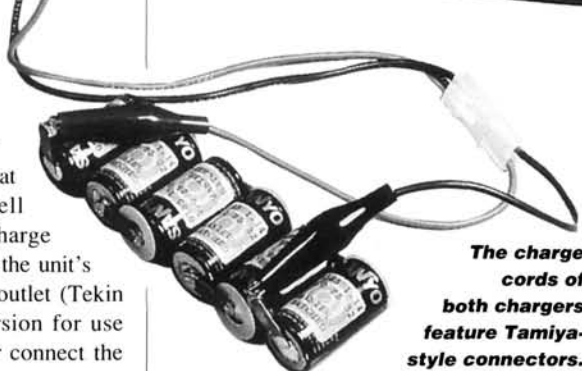
"cold start" mode, the peak-detection circuit is less sensitive initially, so the pack will build sufficient voltage to take a full charge. No more false peaks!

- **Trickle-charge.** This slow-charge method gradually "tops off" and balances the battery pack. The trickle current can vary from 0 to 200mAh, depending on the amp setting of the fast-charge mode.

USING THE CHARGERS

Both the BC48 and the BC67 will charge 6- to 8-cell packs at up to 5 amps and 4- to 5-cell packs at up to 2 amps. To charge using the AC/DC BC67, plug the unit's AC cord into any 120V AC outlet (Tekin offers the BC68 AC/DC version for use with other input voltages), or connect the supplied DC cord to a 12V power supply. With the BC48, just connect to a DC supply. The charge leads have a Tamiya-style connector that can be hooked up to most batteries. Tekin includes a set of alligator leads that allow you to charge almost any type of pack.

After the chargers have been connected to the battery pack, the LCD display will show the pack's voltage. Choose the charge



The charge cords of both chargers feature Tamiya-style connectors. A set of high-quality alligator-clip leads are included to allow almost any type of pack to be charged.

remembers the reading until the charge button is pressed again.

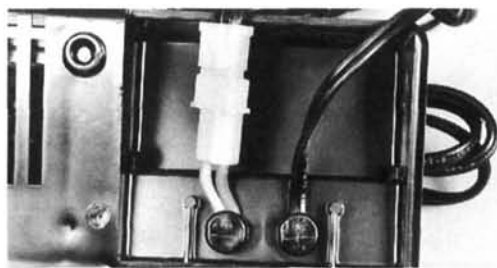
- **Trickle on/off switch.** When the mode switch is pressed so that the "set trickle" display comes up, just press the start button to show whether the trickle-charge is off or on.

CHARGE PROTECTION

Both chargers are protected by a user-replaceable, 15A fuse, and the BC67 also has an internal fuse for added protection. If something out of the ordinary occurs when using the chargers, such as a short or an excessive current flow, one of several error codes will be shown on the display. Each error code denotes a specific problem, so you'll know right away what's wrong and how to fix it.

Overall, I give Tekin's new chargers the highest rating. I've been using the BC67 for several weeks and have noticed a pronounced decrease in the number of false peaks. Also, I no longer have to carry a power supply with me to the track. The BC48 is great for those who want all of the BC67's features but may have already invested in a 12V power supply. Both chargers have all the features pro racers and hobbyists need for maximum R/C fun.

**Here's the address of the manufacturer featured in this article:*
Tekin Electronics, 940 Calle Negocio, #140, San Clemente, CA 92673; (714) 366-9016. ■



The BC67's DC input cord (left) can be disconnected from the unit when the AC cord (right) is in use. Doing this will prevent the DC cord from causing a short.

mode you wish to use and the desired amperage, and you can scroll through the display to monitor several functions.

- **Peak volts.** Remembers the pack's peak-charging voltage. Saves the voltage reading at the end of the charge. This will be reset when the start button is pressed.

- **Volts.** Shows the power-supply input voltage; when the battery is connected, it will show the pack's voltage.

- **Charge amps.** Reads the amperage going into the battery as it's being charged.

- **Time.** Shows how long the charge cycle is taking and has taken. Like the peak volts, it

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SCOPING OUT

NOVAK ROOSTER

by JOHN RIST

ONCE again, Novak*—a world leader in innovative electronic speed controller (ESC) design—shakes up the industry with a new reversing ESC—the Rooster!

Reversing ESCs are rarely used in racing machines, but they're great for backyard burners and scale projects. Most are bought as replacements for the hard-to-set-up and often unreliable mechanical controllers that come in off-road buggies and trucks. That's why the Rooster should be especially well-received: it's reliable, and it can be set up by just one touch of a button.

ANYTHING TO CROW ABOUT?

Like its barnyard namesake, the Rooster is brightly colored; and it comes with one of the hottest decals I've seen—Novak's new mascot, the mighty Rooster.

To check inside, I flipped it over and looked for the screws. *Nothing!* So how could I open the case? I discovered that each wire exit hole is ringed by a plastic snap ring. A gentle nudge with a small screwdriver under the edge of each ring had the case open in a jiffy.

Inside, I found two printed-circuit boards: a small one for the control circuitry and a larger one for the power-handling FETs. Most of the components are surface mounted, and the largest is a 28-pin integrated circuit that has "Novak REV 1" printed on top—a sure sign that it was custom designed by Novak. Next to this, there's a single button instead of the usual flock of adjustment pots.

The heat sink is a massive extruded-aluminum affair that provides a large cooling area and a lot of surface area to make contact with the eight, current-handling FETs. These FETs have insulated tabs, so there's no possibility of a short between them destroying the ESC. (It's a little hard-

er to keep this type of FET cool, but the super heat sink takes care of this problem.)

CROW WITH THE FLOW—CURRENT FLOW!

Instead of in the usual great Novak instruction book, the Rooster's instructions are on a large, folded, double-sided sheet, but they're just as clear and comprehensive as usual. The large sheet has room for a big, highly detailed diagram of how the Rooster should be installed in a car.

With the Rooster connected to my bench supply and my Pit Stop radio (which emulates the output of a receiver), I used the One-Touch Set-Up™. The Rooster immediately matched itself to my radio. Using an oscilloscope, I checked to see where full throttle was. It seemed to be at 80 percent of full trigger travel—exactly the point I would have picked if I had adjusted the ESC manually. The One-Touch Set-Up™ works as well and as easily as Novak claims.

• **Test 1.** With 12 amps of current flowing, I measure the voltage drop across the ESC and then calculate its "on" resistance by dividing the measured voltage drop by 12. I measure resistance twice—along the full length of the motor wires and battery wires (including connectors) and 2 inches along them. The first reading helps me to determine an ESC's "on" resistance as it comes from the factory, and the second gives a standard reading with which I compare ESCs.

Reversing ESCs generally have higher resistance than forward-only styles, and high resistance means less power for the motor and dangerous overheating.

—End-to-end voltage drop: 0.32 volt—a resistance of 0.026 ohm.



—Voltage drop 2 inches

along the wires: 0.23 volt—a resistance of 0.019 ohm. This resistance is too high for serious racing but, with the Rooster's massive heat sink, it's low enough to operate reliably in almost any car that runs a stock mild modified motor.

• **Test 2.** The Rooster has automatic thermal protection—a two-step process that first cuts the throttle back to half speed and then, if the overheating reaches a dangerous level, activates a complete shutdown. I "cook" every controller I test by adjusting the resistor bank to pass 20 amps of current, jamming the throttle wide open and running the ESC for 15 minutes while it pumps a hefty 20 amps (which would mean a 4-minute dump from an average battery pack). The heat sink was in place, but there was no cooling fan. After 15 minutes, the controller was too hot to touch, but it hadn't automatically shut off—proof that the Rooster is one tough bird.

THE ROOSTER RATES!

This controller was very easy to install and set up:

- There are no screws in the bottom of the case—just a flat, smooth surface for the double-sided tape to bond to.
- It comes with a full set of connectors.

WHAT'S NEW?

Novak's new One-Touch Set-Up™ makes the Rooster exceptionally easy to use.

- Press the "SET" button for a second or so until the LED turns a solid red.
- Pull full throttle until the LED turns a solid green (takes less than a second).
- Push full reverse until the LED blinks green (takes about a second).
- Let the throttle return to neutral and wait until the LED turns a solid red (about a second).
- The Rooster is ready to rumble.

If you have an adjustable transmitter, the instruction sheet tells you how to adjust it for maximum setup smoothness, but the Rooster will sense any setup and set itself up to match it.

- It has One-Touch Set-Up™ so matching the Rooster to your transmitter is a 3-second job.

Ratings

—Throttle response: very smooth, especially at slow speeds.

—Top-end speed: excellent.

—Run times: good (5 minutes).

—Heating: heat sink was barely above

room temperature. It

gets plenty of cooling air, and it was about 38 degrees Fahrenheit on the day I ran the test.

—Reverse: one of the strongest I've

seen in a long time. Its 1-second reverse delay is short enough not to be irritating, yet long enough to avoid destroying the gearbox. At full throttle in reverse, the car flies.

On the second run, I decided to play with the programming to see

if you've been told that your radio isn't suitable for an ESC, try the Rooster. I can almost guarantee that it will work perfectly with your radio.

WHAT IT HAS

- Eight FETs (four for forward; four for reverse).
- Massive extruded-aluminum heat sink.
- One-button, One-Touch Set-Up™.
- High-frequency motor control.
- Automatic thermal protection.
- Tamiya-style battery connector and bullet motor connectors.
- Motor capacitors.
- Universal receiver plug set.

NOVAK ROOSTER

DIMENSIONS

Height	1.2 in.
Width	1.64 in.
Length	2.02 in.
Weight (with heat sink)	3 oz.

TUNING

Access to controls	Excellent
Ease of adjustment	Excellent

LIST PRICE/WARRANTY	\$129/ 90 days
---------------------------	-------------------

ELECTRICAL (Novak specs)

Max. voltage	7 cells
Min. voltage	6 cells

Rated current	100 amps
Resistance	0.018 ohm

TEST PARAMETERS

Voltage	6 volts
Current	12 amps
Voltage drop	
—along full length of wires	0.32 volt
—2 in. along wires	0.23 volt

CALCULATED RESISTANCE

—along full length of wires	0.026 ohm
—2 in. along wires	0.019 ohm
BEC voltage, 6-cell pack	5.63 volts
Resistance = voltage drop/current	

Comments: with its innovative One-Touch Set-Up™, the Rooster is easy to match to any transmitter. With help from the first-class instruction sheet, even novices should be able to handle installation and setup. The Rooster automatically matches itself to the direction of forward and reverse trigger travel. So if you have a low-end radio that doesn't have a throttle-channel reversing switch, the Rooster will sense the way your radio signal is going and adjust itself accordingly. It has a generously large heat sink for cool running.

whether any settings would affect the Rooster's capability to match itself to a transmitter. I flipped the channel-reversing switch on the transmitter, and the car went backward when I pulled forward on the transmitter trigger. I then pressed the Rooster's program button and moved the transmitter

trigger through its range. After this simple, 3-second procedure, forward and reverse were correct.

Could I program the Rooster to have a hair trigger? I pressed the program button again, but this time, I moved the throttle only just a hair past neutral toward forward (about 10 percent trigger travel). I finished the sequence by pushing the trigger to full reverse and letting it go back to neutral. Reverse throttle response was still

normal, but forward had a hair trigger because, at 10 percent of trigger travel, the Rooster was wide open. I'm not sure why anyone would want a hair-trigger setup (drag racing perhaps?) but the fact that the Rooster did accept this radical

trigger programming tells me that it will match itself to any transmitter, no matter what its output range.

The one button, One-Touch Set-Up™, really does work. You'll only dork it up if, while programming, you go first to reverse and then to forward. The car will then go backward when you give it forward throttle.

The Rooster is an ideal choice if you have a low-end radio, e.g. a stick radio, that doesn't have channel-reversing or other fancy features. The Rooster will instantly match itself to this type of radio simply by going through the program sequence. So if you've been told that your radio isn't suitable for an ESC, try the Rooster. I can almost guarantee that it will work perfectly with your radio.

Novak has come up with a winner with the one-button-setup Rooster. In fact, the One-Touch Set-Up™ works so well that I wouldn't be surprised to see it on future Novak speed controllers. If you're fighting a pesky mechanical speed controller and are looking for a trick reversing controller that's easy to install and set up, answer the wake-up call of the Rooster.

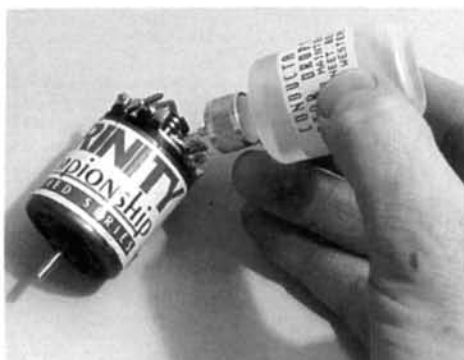
**Here's the address of the company that's featured in this article:
Novak Electronics Inc., 18910 Teller Ave., Irvine, CA 92715; (714) 549-0875. ■*



R/C DOCTOR

by DOUG MERTES

Comm Drops: Fact or Fiction?



Left: most comm drops can be squirted or sprayed onto the commutator. Rotate the motor shaft before you run the car.

Below: some instructions recommend that you put a drop or two on the end of each brush and then re-insert them in the brush hoods.

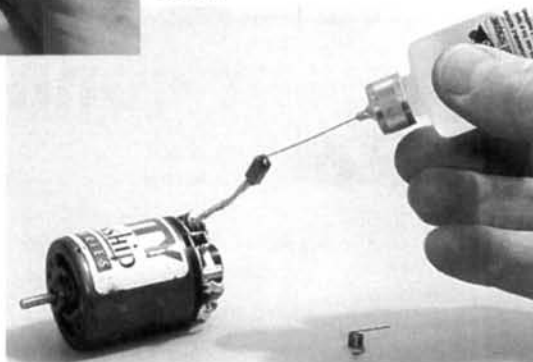
FOR YEARS, I've been watching racers squirt, drop and spray various combinations of mystery fluids onto the commutators of their motors, certain that they were adding mega-horsepower to their car's performance envelope. Although I had tried comm drops from time to time, I had never really come to any conclusions as to whether the stuff was worthwhile. Squinting something into or onto your motor to increase performance seemed more than just a little weird to me.

To determine the value of using these preparations, I locked myself in my secret laboratory and ran a series of tests comparing treated and untreated motors. Using an RSR dynamometer and stock and modified motors (both ROAR- and NORRCA-legal) from several major manufacturers, I tested seven brands of additives and treatments.

COMM-DROP COMPARO

The combatants:

- Trinity/Revtech* Commutator Drops
- Gator Racing* Comm Drops
- CRC* Speed Juice
- Class Products* Liquid Horsepower
- Trinity Speed Spray



- Reedy* in a Can
 - Aero-Car* Conducta Motor Drops
- The motors (two of each):
- Epic/Trinity* Slot Machine and Slot Machine 2 and Monster Stock Jr.
 - Speedworks* Green Machine
 - Reedy Force 1 and Force 2
 - A couple of 14 double winds based on Trinity cans and two 18 double



The glazed brush on the left came from an untreated motor. The one on the right came from a motor that used comm drops.

winds based on Yokomo* cans.

THE TESTS

First, each motor was run three times on the RSR to break in the brushes and establish a base-line reading for power, torque and amp draw under load. Then, each was treated according to the directions that accompanied each product. When no instructions

were included, I simply squirted the drops onto the commutator, and the spinning rotor spread the drops around the comm. Then the motor was rerun on the dyno to determine the effect (if any) on performance.

After testing all the motors (twice each, to ensure consistency) with the stock brushes, I replaced the brushes with various after-market ones. (Although not many racers run OEM brushes at the track, I wanted to see if they would make a difference.) I tried silvers, silver cavities, hards, softs, venturis and every other brand, configuration and type of brush I could think of or get my hands on. Although there was a noticeable performance change with all of these brushes, there was no real difference in the overall effect of the drops. In other words, the drops provide the same performance enhancement regardless of which type or brand of brush you use.

Then I ran a third group of tests, changing only the motor brush springs. Here, the results were a little different: motors with lighter springs showed the effect of the power drops for a longer period of the dyno run than motors with heavier springs. The pressure of the heavier spring against the brush and comm apparently causes the fluid to burn or evaporate more



The winners!

rapidly. Likewise, a smaller brush face used up the fluid faster than a full brush face. Why? A smaller brush face with equal spring tension means higher pressure per square inch at the commutator.

To see the effect of long-term running with comm drops, after all the tests, I popped the cans of the stock motors and disassembled the modified motors. Don't forget, each of these motors had been through at least two dozen dyno runs without any cleaning! I examined each can and comm and cut every commutator on Twister's* Commutator Lathe to determine how much they had been worn.

RESULTS-O-RAMA

None of the products I tested caused a drop in power during testing. That's good, because I was concerned about fellow RC'ers totally wasting their money in the pursuit of speed.

Four of the products didn't provide a consistent, measurable performance improvement. From time to time, there was a modest rpm rise or a reduction in amp draw for a single dyno run, but the results were minor and couldn't be duplicated.

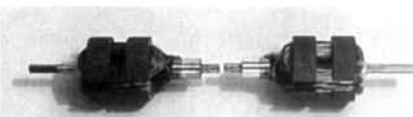
The other products did provide a consistent performance increase—nothing really stunning, mind you, but a performance increase nonetheless. Run after run, each one yielded an average of an additional 400rpm on the top end and a reduction in amp draw (measured by the RSR) of about 10 percent, regardless of motor, brush, or spring type.

Each of these products also seemed to reduce "brush glaze," that shiny end-of-the-brush condition so reviled by 1/12-scale and oval racers. Racers think that brush glaze reduces "punch" coming out of turns, especially during the final minute or so of racing. I'm not yet convinced that this reduced punch isn't just the result of the battery being on the downside of its discharge curve. I did rerun each motor during testing, with and without glazed brushes, and I saw no real performance change that I could

attribute to that condition alone.

I had expected to see a lot of charred gunk, kind of like burned avocado, inside the motors owing to the amount of stuff they were ingesting. Instead, I found them to be pretty much the same as average, unsquirted, untreated ones. Boy, was I surprised! I had heard all sorts of stories about having to clean your motor after every run when using comm drops, and I've seen racers running to the pits to flush out their motors prior to marshalling the next race.

Even after all those dyno runs, none of the comms—stock or modified—required more than a light touchup on the comm lathe to be as good as new. So, even if you don't see a major performance increase, comm drops do seem to make your motor run with less abrasion between the brush and commutator. That's why the brush glaze is reduced on the treated motors.



The armature on the left was in a treated motor that had more than two dozen dyno runs on it. The one on the right has been re-cut.

THE ENVELOPE, PLEASE...

So, which comm drops provided the *greatest* performance gain? I recommend: Aero-Car Conducta Motor Drops, Trinity/Revtech Commutator Drops, CRC Speed Juice and Class Products Liquid Horsepower.

So, go ahead: spray, squirt and enjoy! If you have a special recipe for speed drops (for instance, the legendary "Black Death"), write to me, the R/C Car Doctor, at R/C Car Action, 251 Danbury Rd., Wilton, CT 06897. I'm dying to hear about your secret motor drops!

**Here are the addresses of the companies mentioned in this article:*

Trinity/Revtech, 1901 East Linden Ave. #8, Linden, NJ 07036; (908) 862-1705.

Gator Racing, 709 Timberset Ct., Lutz, FL 33549.

CRC (Calandra Racing Concepts), 6860 Stanwix Ave., Rome, NY 13440.

Class Recreational Products, RD #1, Box 187A, Utica, NY 13502.

Reedy Co., distributed by Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342.

Aero-Car Technology, P.O. Box 336, Western Springs, IL 60558; (708) 246-9027.

Epic/Trinity (see address above).

Speedworks, distributed by Trinity Products Inc. (see address above).

Yokomo, distributed by Associated Electrics Inc. (see address above).

Twister Motors, 657 E. Arrow Hwy. #H, Glendora, CA 91740.

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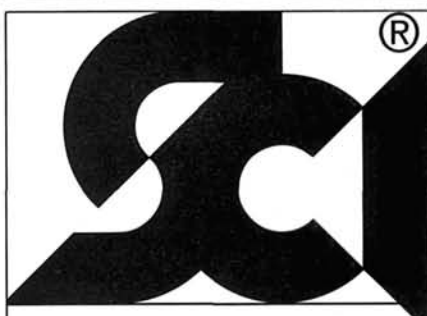
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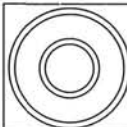
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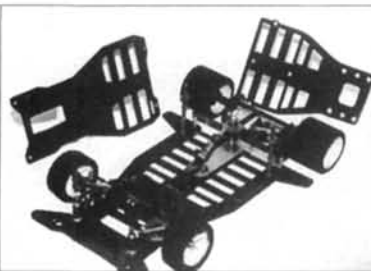
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